

TOWN OF MERRIMACK

**SUNSET SHORES
SEWER AND WATER EXTENSION AND DRAINAGE
IMPROVEMENTS PROJECT**

January, 2015

Contract Documents
And
Technical Specifications

Department of Public Works
Town of Merrimack, New Hampshire
6 Baboosic Lake Road
Merrimack, NH 03054

INVITATION TO BID

Town of Merrimack
Naticook Road Area Drainage
Merrimack, New Hampshire

Sealed proposals for the “***Sunset Shores Sewer/Water Extension***,” Merrimack, New Hampshire, will be received at the Finance Office, Town of Merrimack, NH (The Owner”), 6 Baboosic Lake Road, Merrimack, NH, 03054, until 2:00 p.m., Friday, February 13, 2015 . Bids received after the specified time will not be accepted.

The Sunset Shores Contract will consist of installation of sewer pipe, pump stations, water line, storm drainage piping, pre-cast concrete catch basins and manholes, hot bituminous base patching, reclaimed stabilized base, bituminous curbing, hot bituminous pavement, loam & seed, maintenance of traffic and other incidental construction items.

Plans and specifications may be viewed at the offices of:

(1) Town of Merrimack PUBLIC WORKS Administration, 6 Baboosic Lake Road, Merrimack, NH, 03054

Copies of the plans and specifications may be obtained from the Town of Merrimack, Public Works Administration Office for a non-refundable fee of \$50.00 per set (checks should be made out to The Town of Merrimack) with an additional fee of \$15.00 per set if requested by mail.

Bidders will be required to furnish a bid bond in the amount of 10% of the total bid, and the successful bidder will be required to furnish a Performance Bond and a Payment Bond each in the amount of 100% of the Contract Price.

The Owner reserves the right to waive any informalities in any or all proposals, to reject any or all proposals, or accept any proposal submitted for the project, as deemed by the Town of Merrimack to be in its best interests based upon qualifications, experience, demonstrated ability to perform, cost and other factors deemed by the Town to bear on the successful outcome of the Contract.

INSTRUCTIONS TO BIDDERS

1. **BID OPENING** of this project is scheduled for 2:00 p.m., Friday February 13, 2015, at the Finance Office, 6 Baboosic Lake Road, Merrimack, NH, 03054. Construction is intended to start upon Notice to Proceed, and must be substantially complete by September 15, 2015.
2. **BID ITEMS:** The unit cost bid items are based on the work outlined in the Plans and Specifications as presented herein.

Prices in the Bid Proposal shall not be unbalanced. Unbalanced bids may be cause for rejection.

3. **CONTRACT DOCUMENTS AND SITE OF WORK:** Before submitting a proposal, the bidder shall examine carefully the Contract Documents and the site of the proposed work. He shall satisfy himself as to the character, quality, and quantities of work to be performed and materials to be furnished and shall make his own estimate of the facilities and difficulties attending the execution of the work. The submission of a proposal by a bidder shall be conclusive evidence that the bidder has complied with these requirements. Claims for additional compensation due to variations between conditions actually encountered in construction and as indicated by the plans except for payment under the specific payment items included herein, will not be allowed, unless in full conformance with the General Conditions Article 4.03.
4. **PREPARATION OF PROPOSAL:** The bidder must submit his proposal on the Bid Proposal form included herein. The blank spaces for each item in the proposal forms shall be correctly filled in, by writing in words and numerals, in ink. The bidder must submit a price for each item in the proposal, including all bid alternates and supplemental unit prices. In case of conflict between words and numerals, **the words shall govern**. The proposal shall be executed with ink in the complete and correct name of the individual, firm, or corporation making the proposal and signed by the person or persons authorized to bind the individual, firm, or corporation. Bids by corporation shall have the corporate seal affixed.

The bidder shall properly acknowledge all addenda in the spaces provided on the proposal form and acknowledge submission of all required bid documents as shown on the proposal form.

5. **ADDENDA:** Bidders desiring further information, clarification, or interpretation of the plans, specifications, or other Contract Documents must make a request for such information to the Engineer, no later than one hundred and twenty (120) hours before the bid opening. Answers to such requests will be given in writing to all bidders, in addendum form, and all addenda shall then be bound with, and made a part of, the Contract Documents. No other explanation or interpretation will be considered official or

binding. The Engineer will not be responsible for any other interpretations of the plans, specifications, or Contract Documents.

Should a bidder find discrepancies in or omissions from the plans, specifications, or other Contract Documents, if the bidder is in doubt as to their meaning, the bidder should at once notify the Engineer in order that a written addendum may be sent to all bidders. No addenda will be issued after seventy-two (72) hours before the opening of bids. Addenda will be mailed or delivered by fax to each Contractor contemplating the submission of a proposal on this work who has acquired plans and specifications from Town of Merrimack, Public Works Administration. The proposal as submitted by the Contractor will be so constructed as to include all addenda, issued by the Engineer prior to seventy-two (72) hours of the opening of bids.

The Town of Merrimack reserves the right to postpone the bid opening date or time, without prior notice, as it deems to be in its best interests.

6. **REJECTION OF PROPOSALS:** Proposals containing any omission, alteration of form, additions or conditions not called for, incomplete bids, or proposals otherwise regular that are not accompanied by acceptable proposal guaranty will be considered irregular and may be rejected. In case of any ambiguity or lack of clarity in stating the prices in the proposal, the Owner reserves the right to consider the most advantageous construction thereof, or to reject the proposal. Unreasonable or unbalanced bid prices may be cause to reject any proposal.
7. **PROPOSAL GUARANTY:** Each proposal must be accompanied by a Cashiers or Certified Check, payable to the Town of Merrimack or an acceptable bid bond in the amount of not less than ten percent (10%) of the total bid (Sum of Parts I and II), payable to the Town of Merrimack as a guaranty that bidder will enter into a contract and furnish bonds on the forms provided within seven (7) days after Notice of Award of Contract to him.
8. **DELIVERY OF PROPOSAL:** Each completed proposal shall be placed together with the proposal guaranty, in an envelope sealed and clearly identified on the outside as a proposal to the Town of Merrimack, and including the project title and name and address of the bidder. When sent by mail, the sealed proposal, marked as indicated above, should be enclosed in an additional envelope. Proposals will not be considered unless received at the place and on or before the time designated in the Invitation to Bid.
9. **WITHDRAWAL OF PROPOSALS:** Any bidder, upon his written request, will be given permission to withdraw his proposal no later than the time set for the opening thereof.
10. **QUALIFICATION OF BIDDER:** The qualifications, experience, and demonstrated ability to complete the work on time and as specified are of importance to the Owner and will be given significant consideration in the selection of a bidder. Before being awarded the contract the bidder may be required to submit such evidence as the Owner may require establishing his financial responsibility, experience, and possession of such equipment as may be needed to prosecute the work in an expeditious, safe, and satisfactory manner.
11. **DISQUALIFICATION OF BIDDERS:** The following are some of the causes which may be considered as sufficient for the disqualification of a bidder and the rejection of his proposal:

- More than one proposal for the same work from an individual, firm, partnership, or corporation.
- Evidence of collusion among bidders.
- Poor performance in the execution of work under previous contracts.
- Inability to demonstrate qualifications and/or information as outlined in 10. above, or 13. Below.
- For being in arrears on existing contracts, or having defaulted on a previous contract.

The Owner reserves the right to waive any informalities in any or all proposals, to reject any or all proposals, or accept any proposal submitted for the project, as deemed by the Owner to be in its best interest based upon qualifications, experience, demonstrated ability to perform, cost, or other factors deemed by the Owner to bear on the successful outcome of the Contract.

12. **CONSIDERATION OF PROPOSALS:** For the purpose of determining a bidder for award, after the proposals are opened and read, the summation of the products of the prices will be considered the amount of the bid.

The information provided by bidders shall be evaluated to determine compliance with the requirements of the project, and other comparative favorability to the Owner. The Owner reserves the right to accept or reject any and all proposals, consider awarding the contract on the basis of any combination of bid alternates, and waive technicalities as may be considered to be in the best of the Owner.

13. **SUBMISSION OF POST BID INFORMATION:** Upon request by the Engineer, selected bidders shall within three (3) calendar days thereafter submit the following:

- 1) A designation of the work to be performed by the bidder with his own forces.
- 2) A list of the names of the subcontractors or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for such portions of the work. The bidder will be required to establish to the satisfaction of the Owner the reliability and responsibility of the proposed subcontractors to furnish and perform such portions of the work.

Prior to the award of Contract, the Owner will notify the bidder in writing if the Owner, after due investigation, has reasonable and substantial objection to any person or organization on such list. If the Owner has a reasonable and substantial objection to any person or organization on such list, and refuses in writing to accept such person or organization, the bidder may, at the bidder's option, withdraw his bid without forfeiture of bid security, notwithstanding anything to the contrary contained herein. If the bidder submits an acceptable substitute with an increase in the bid price to cover the difference in cost occasioned by such substitution, the Owner may, at its discretion, accept the increased bid price or may disqualify the bidder. Subcontractors and other persons and organizations proposed by the bidder and accepted by the Owner must be used on the work for which they were proposed and accepted and shall not be changed except with the written approval of the Engineer.

- 3) A proposed work schedule demonstrating the Bidder's plan to complete the work in the required time frame.
14. AWARD OF CONTRACT: Only one Contract will be awarded for all the work called for in the plans and specifications.
15. RETURN OF PROPOSAL GUARANTY: The proposal guaranty accompanying the proposals, may be retained until the Contract is awarded and the successful bidder executes the Contract and furnishes the required bonds, after which all proposal guaranties will be returned to the bidders.
16. EXECUTION OF CONTRACT AND BONDS: The Contract will include all Contract Documents. Within seven (7) days after award of the Contract, the successful bidder shall execute the Contract in triplicate, and furnish the Owner with Performance and Payment Bonds each in the full amount of the Contract price executed by a surety company acceptable to the Owner. The Bonds are to be furnished as a guaranty of the faithful performance of the work and for protection of the claimants for labor and materials.
17. FAILURE TO EXECUTE CONTRACT AND BONDS: Should the bidder to whom the Contract is awarded refuse or neglect to execute the Contract and furnish the required bonds within seven (7) days after notice of award of the Contract, at the option of the Owner, the bidder's proposal shall be treated as withdrawn; and at the option of the Owner the proposal guaranty shall become the property of the Owner, not as a penalty, but as liquidated damages, or the Owner may pursue any other action allowed by law.

END OF SECTION

BID PROPOSAL

BIDDER:

PROJECT:

Town of Merrimack, Sunset Shores Sewer/Water Extension
Merrimack, New Hampshire

OWNER:

Town of Merrimack, New Hampshire

NO.	ITEM	Unit	EST QTY	Unit Bid PRICE (WORDS)	Subtotal (FIGURES)
1.	Item 201.1 - Clearing and Grubbing (F)	SY	700	<div></div> <div></div> Dollars and <div></div> cents per square yard.	\$ <div></div>
2.	Item 201.21 - Removing Small Trees	EA	2	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ <div></div>
3.	Item 201.22 - Removing Large Trees	EA	7	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ <div></div>
4.	Item 203.1 - Common Excavation	CY	510	<div></div> <div></div> Dollars and <div></div> cents per cubic yard.	\$ <div></div>
5.	Item 203.6 - Embankment In Place (F)	CY	40	<div></div> <div></div> Dollars and <div></div> cents per cubic yard.	\$ <div></div>

NO.	ITEM	Unit	EST QTY	Unit Bid PRICE (WORDS)	Subtotal (FIGURES)
6.	Item 206.1 - Common Structure Excavation	CY	120	<div></div> <div></div> Dollars and <div></div> cents per cubic yard.	\$ _____
7.	Item 206.19 - Common Structure Excavation - Exploratory	CY	80	<div></div> <div></div> Dollars and <div></div> cents per cubic yard.	\$ _____
8.	Item 206.2 - Rock Structure Excavation	CY	40	<div></div> <div></div> Dollars and <div></div> cents per cubic yard.	\$ _____
9.	Item 214 - Fine Grading	U	1	<div></div> <div></div> Dollars and <div></div> cents per unit.	\$ _____
10.	Item 304.2 - Crushed Gravel	CY	90	<div></div> <div></div> Dollars and <div></div> cents per cubic yard.	\$ _____
11.	Item 306.112 - Reclaimed Stabilized Base Processed In Place - 12" Deep	SY	6,500	<div></div> <div></div> Dollars and <div></div> cents per square yard.	\$ _____
12.	Item 403.11 - Hot Bituminous Pavement, Machine Method	T	1,600	<div></div> <div></div> Dollars and <div></div> cents per ton.	\$ _____

NO.	ITEM	Unit	EST QTY	Unit Bid PRICE (WORDS)	Subtotal (FIGURES)
13.	Item 403.115 - Hot Bituminous Pavement, Trench Repair	SY	750	<div></div> <div></div> Dollars and <div></div> cents per square yard.	\$ _____
14.	Item 403.12 - Hot Bituminous Pavement, Hand Method	T	140	<div></div> <div></div> Dollars and <div></div> cents per ton.	\$ _____
15.	Item 520.1 - Concrete, Class A	CY	25	<div></div> <div></div> Dollars and <div></div> cents per cubic yard.	\$ _____
16.	Item 583.1 - Riprap A	CY	10	<div></div> <div></div> Dollars and <div></div> cents per cubic yard.	\$ _____
17.	Item 603.81015 - 15" PVC Pipe	LF	300	<div></div> <div></div> Dollars and <div></div> cents per linear foot.	\$ _____
18.	Item 603.82212 - 12" Plastic Pipe (smooth interior)	LF	750	<div></div> <div></div> Dollars and <div></div> cents per linear foot.	\$ _____
19.	Item 604.0007 - Polyethylene Liner	EA	9	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ _____

NO.	ITEM	Unit	EST QTY	Unit Bid PRICE (WORDS)	Subtotal (FIGURES)
20.	Item 604.12 - Catch Basin, Type B	U	9.3	<div></div> <div></div> <div>Dollars and</div> <div></div> <div>cents per unit</div>	\$ _____
21.	Item 607.36 - Chain Link Fence, Vinyl Coated Steel Fabric, 6' High	LF	180	<div></div> <div></div> <div>Dollars and</div> <div></div> <div>cents per linear foot</div>	\$ _____
22.	Item 607.436 - Post Assemblies for Chain Link Fence 6' High	EA	25	<div></div> <div></div> <div>Dollars and</div> <div></div> <div>cents per each</div>	\$ _____
23.	Item 607.73612 - 12' Opening Double Gate, Chain Link Vinyl Coated, 6' High	U	3	<div></div> <div></div> <div>Dollars and</div> <div></div> <div>cents per unit</div>	\$ _____
24.	Item 609.83 - Bituminous Curb, Merrimack Standard	LF	2,800	<div></div> <div></div> <div>Dollars and</div> <div></div> <div>cents per linear foot.</div>	\$ _____
25.	Item 611.1008 - 8" PVC Water Pipe	LF	1,350	<div></div> <div></div> <div>Dollars and</div> <div></div> <div>cents per linear foot.</div>	\$ _____
26.	Item 611.52007 - Water Service Including Tap & Curb Stop	EA	20	<div></div> <div></div> <div>Dollars and</div> <div></div> <div>cents per each.</div>	\$ _____

NO.	ITEM	Unit	EST QTY	Unit Bid PRICE (WORDS)	Subtotal (FIGURES)
27.	Item 611.6002 - 2" HDPE Water Pipe	LF	500	<div></div> <div></div> Dollars and <div></div> cents per linear foot.	\$ _____
28.	Item 611.70008 - 8" Fitting	EA	6	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ _____
29.	Item 611.71002 - 2" Gate Valve	EA	3	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ _____
30.	Item 611.71008 - 8" Gate Valve	EA	7	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ _____
31.	Item 611.7302 - 2" Blow Off	EA	2	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ _____
32.	Item 611.8101 - Hydrants, Including Lateral and Valve	EA	2	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ _____
33.	Item 611.90001 - Adjusting Water Gates and Shutoffs Set By Others	EA	4	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ _____

NO.	ITEM	Unit	EST QTY	Unit Bid PRICE (WORDS)	Subtotal (FIGURES)
34.	Item 611.90002 - Tapping Main	EA	1	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ <div></div>
35.	Item 612.10 - Sewer Pump Station, Complete Including Emergency Generator	U	3	<div></div> <div></div> Dollars and <div></div> cents per unit.	\$ <div></div>
36.	Item 612.3103 - 3" PVC SDR 26 Sewer Pipe (Force Main)	LF	1,600	<div></div> <div></div> Dollars and <div></div> cents per linear foot.	\$ <div></div>
37.	Item 612.3106 - 6" PVC Sewer House Service Including Cleanout	EA	47	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ <div></div>
38.	Item 612.3108 - 8" PVC SDR 35 Sewer Pipe	LF	2,800	<div></div> <div></div> Dollars and <div></div> cents per linear foot.	\$ <div></div>
39.	Item 612.7104 - Sewer Manholes, 4' Diameter	VF	150	<div></div> <div></div> Dollars and <div></div> cents per vertical foot.	\$ <div></div>
40.	Item 612.7105 - Sewer Manholes, 5' Diameter	VF	25	<div></div> <div></div> Dollars and <div></div> cents per vertical foot.	\$ <div></div>

NO.	ITEM	Unit	EST QTY	Unit Bid PRICE (WORDS)	Subtotal (FIGURES)
41.	Item 615.03 - Traffic Sign, Type C	SF	20	<div></div> <div></div> Dollars and <div></div> cents per square foot.	\$ _____
42.	Item 618.6 - Uniformed Officers	\$	1	<div></div> One Thousand <div></div> Dollars and <div></div> No <div></div> cents.	\$ <u>1,000.00</u>
43.	Item 618.7 - Flaggers	HR	550	<div></div> <div></div> Dollars and <div></div> cents per hour.	\$ _____
44.	Item 619.1 - Maintenance of Traffic	U	1	<div></div> <div></div> Dollars and <div></div> cents per unit.	\$ _____
45.	Item 628.2 - Sawed Bituminous Pavement	LF	1,800	<div></div> <div></div> Dollars and <div></div> cents per linear foot.	\$ _____
46.	Item 632.3112 - Retroreflective Paint Pavement Markings, 12"	LF	60	<div></div> <div></div> Dollars and <div></div> cents per linear foot.	\$ _____
47.	Item 641 - Loam	CY	40	<div></div> <div></div> Dollars and <div></div> cents per cubic yards.	\$ _____

NO.	ITEM	Unit	EST QTY	Unit Bid PRICE (WORDS)	Subtotal (FIGURES)
48.	Item 645.43 - Temporary Slope Stabilization, Type C	SY	205	<div></div> <div></div> Dollars and <div></div> cents per square yard.	\$ <div></div>
49.	Item 645.51 - Straw Bales for Temporary Erosion Control	EA	50	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ <div></div>
50.	Item 645.531 - Silt Fence	LF	100	<div></div> <div></div> Dollars and <div></div> cents per linear foot.	\$ <div></div>
51.	Item 646.51 - Turf Establishment with Mulch and Tackifiers	SY	1,850	<div></div> <div></div> Dollars and <div></div> cents per square yard.	\$ <div></div>
52.	Item 670.066 - Mailbox Support Assemblies	EA	38	<div></div> <div></div> Dollars and <div></div> cents per each.	\$ <div></div>
53.	Item 692 - Mobilization	U	1	<div></div> <div></div> Dollars and <div></div> cents per unit.	\$ <div></div>
54.	Item 699 - Miscellaneous Temporary Erosion and Sediment Control	\$	1	<div></div> <div>Two Thousand</div> Dollars and <div>No</div> cents.	\$ <u>2,000.00</u>

NO.	ITEM	Unit	EST QTY	Unit Bid PRICE (WORDS)	Subtotal (FIGURES)
55.	Item 1002.1 - Alterations and Additions as Needed – Water Mains	\$	1	<u>Nine Thousand</u> Dollars and <u>No</u> cents.	\$ <u>9,000.00</u>
56.	Item 1002.2 - Alterations and Additions as Needed – Sewer Mains	\$	1	<u>Twenty Thousand</u> Dollars and <u>No</u> cents.	\$ <u>20,000.00</u>
57.	Item 1002.3 - Alterations and Additions as Needed – Drainage/Roadway	\$	1	<u>Six Thousand</u> Dollars and <u>No</u> cents.	\$ <u>6,000.00</u>
58.	Item 1010.15 - Fuel Adjustment	\$	1	<u>Fifteen Thousand</u> Dollars and <u>No</u> cents.	\$ <u>15,000.00</u>
59.	Item 1010.2 - Asphalt Cement Adjustment	\$	1	<u>Ten Thousand</u> Dollars and <u>No</u> cents.	\$ <u>10,000.00</u>

END OF SECTION

AGREEMENT

THIS AGREEMENT is by and between _____ Town of Merrimack _____ (“Owner”) and
_____. (“Contractor”).

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

- A. Install a new sewer, water, and drainage systems/augment the existing sewer, water, and drainage systems and to rehabilitate the roadways in the Sunset Shores Subdivision.

ARTICLE 2 – THE PROJECT

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

- A. Sunset Shores Sewer and Water Extension and Drainage Improvements Project.

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by Town of Merrimack, Department of Public Works (Engineer), which is to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Dates for Substantial Completion and Final Payment*

- A. The Work will be substantially completed on or before September 15, 2015, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions on or before September 30, 2015.

4.02 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified

in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner a fee in accordance with the schedule listed in the Supplemental Specification in the Contract Documents.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A, 5.01.B, and 5.01.C below:

- A. For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the actual quantity of that item:

Total of all Bid Prices (Unit Price Work)

(Use Words)

\$ _____

The Bid prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 9.07 of the General Conditions.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 30th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including

but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions.

- a. 100 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
- b. 100 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

ARTICLE 7 – INTEREST

- 7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the maximum rate allowed by law in the state where the project is located.

ARTICLE 8 – CONTRACTOR’S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:
 - A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
 - B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in Paragraph SC-4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph SC-4.06 of the Supplementary Conditions as containing reliable "technical data."
 - E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings

identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.

- F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 1 to 7, inclusive).
 - 2. General Conditions (pages i to 51, inclusive).
 - 3. Supplementary Specifications.
 - 4. Special Attentions.
 - 5. Drawings consisting of 17 sheets with each sheet bearing the following general title: Naticook Lake East Collector Sewer Extension.
 - 6. Addenda (numbers _____ to _____, inclusive).
 - 7. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid.
 - b. Documentation submitted by Contractor prior to Notice of Award.

8. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Notice to Proceed in the form of a Purchase Order.
 - b. Work Change Directives.
 - c. Change Orders.
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

10.06 *Other Provisions*

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on _____, 2015 (which is the Effective Date of the Agreement).

OWNER: Town of Merrimack

CONTRACTOR

By: _____

By: _____

Title: _____

Title: _____

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

Town of Merrimack, DPW

6 Baboosic Lake Road

Merrimack, NH 03054

License No.: _____

(Where applicable)

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

Agent for service of process:

ADDENDA

The BIDDER acknowledges receipt of the following Addendum*

No. _____ Dated

No. _____ Dated

No. _____ Dated

No. _____ Dated

No. _____ Dated

No. _____ Dated

** to be filled in as appropriate*

PROSECUTION OF WORK

The intent of this project is to install a new sewer, water, and drainage systems/augment the existing sewer, water, and drainage systems and to rehabilitate the roadways in the Sunset Shores Subdivision (Ingham Road, Sunset Drive, Dawn Avenue, Highnoon Road, and Morningside Avenue). Liberty Utilities may expand their gas service line to these areas during the construction..

Prior to installing any pipe or structures, the Contractor shall arrange to have all existing utilities located and marked in the field. In addition to calling Dig Safe, the Contractor must contact the Merrimack Village District (424-9241) to locate its water distribution system. After all utilities have been marked in the field, the Contractor shall excavate a test pit at each location that the proposed drain/sewer crosses an existing utility. The Contractor shall measure and record the elevation and horizontal location of each utility at the proposed crossing location. The Contractor shall immediately notify the town's designated project representative in writing of any potential physical conflicts between an existing utility and the proposed drain. The Town will determine whether the utility or the drain will be relocated.

It is the Town's intent that access to properties will be maintained to the greatest extent possible. When it is not possible to provide direct access to a residence due to excavation or other operations in the immediate area, the residents shall be notified in advance and provision shall be made for them to park in a safe, accessible location as close as possible to their home. The Contractor shall provide safe access for local pedestrian traffic.

Alternating single lane traffic will be allowed during daytime hours with appropriate traffic control. The Contractor shall provide all necessary signs, channelizers, and flaggers to provide safe traffic complying with the MUTCD and the Contract Documents.

The project is scheduled to be constructed in part during the school year. The Contractor should make arrangements to allow safe passage of school buses. It is expected that the notice to proceed will be issued on or before March 1, 2015. The completion date for this project is September 15, 2015. No additional time will be granted for weather related issues.

The Contractor shall provide the town with an updated schedule on a weekly basis. The Town will use the schedule information to advise the public of the project schedule through its website, E-mail and other available means.

Work shall be performed in accordance with the plans, agreement, and NHDOT Standard Specifications and Plans, latest editions (2010).

Initial centerline layout at 50 foot stations and suitable bench marks will be provided by the Town. All layout and preservation of initial survey control is the responsibility of the Contractor.

SUPPLEMENTAL SPECIFICATION

FAILURE TO COMPLETE ON TIME

Failure to Complete on Time. For each calendar day or work day that work remains uncompleted after the Contract Time, the sum specified below will be deducted from any money due the Contractor. This sum shall not be considered and treated as a penalty but as liquidated damages due the Town of Merrimack by reason of inconvenience to the public, added cost of engineering and supervision, and other extra expenditures of public funds due to the Contractor's failure to complete the Work on time. Any adjustment of the Contract Time for completion of the Work will be considered in the assessment of liquidated damages.

In the case of a date in the Contract being given for the completion of parts, phases, or stages, the liquidated damages will be deducted for the period in which that particular work specified is uncompleted.

Permission for the Contractor or Surety to continue and finish work after the Contract Time and approved extensions have elapsed shall not waive the Town's rights under the Contract.

The assessment of all or any of the liquidated damages that accrue may be terminated if the Town has determined that the Work is substantially complete and is in a condition for safe and convenient use by the traveling public.

The Work will be considered substantially complete when all necessary signing, striping, guardrail, and other safety appurtenances have been installed. For projects that will not be opened to the traveling public, the Contract will be considered substantially complete when it is ready for the subsequent project. This shall not be construed as a contractual right and its application will be contingent upon the Contractor's diligence in completing the remaining items of work.

Liquidated damages shall be assessed in accordance with the following schedule:

<u>Original Contract Amount</u>		<u>Daily Charge</u>	
<u>From more than</u>	<u>To and including</u>	<u>Calendar Day</u>	<u>Working Day</u>
\$ 0	\$ 100,000	\$ 390	\$ 590
100,000	750,000	590	880
750,000	2,000,000	780	1,170
2,000,000	5,000,000	1,170	1,760
5,000,000	10,000,000	1,560	2,340
10,000,000	20,000,000	1,950	2,930
20,000,000	-----	2,350	3,520

When the Contract Time is on the calendar date basis, the schedule for calendar date shall be used. When the contract time is on a working day basis, the schedule for working days shall be used.

When Acceptance has been made by the Engineer, the daily charge will no longer be assessed.

Should the amount of money otherwise due the Contractor be less than the amount of such liquidated damages, the Contractor and the Surety shall be liable to the Town for such deficiency.

The Engineer has the right to deduct the amount of anticipated liquidated damages against the Contractor from any estimated payment for Work performed under the Contract; or to claim and recover such sums by process of law. Review of anticipated Contract completion and potential liquidated damages will commence when 80% of the original Contract time has elapsed.

SUPPLEMENTAL SPECIFICATION

COOPERATION WITH UTILITIES

Utility items that are to be relocated or adjusted by the utility, others, or the Contractor will be shown in the Contract.

All utility facilities and appurtenances within the construction limits will be shown on the Plans and relocated or adjusted at the utility owner's expense, unless otherwise specified. The locations of these utilities are as provided by the utility owners and may not be exact, particularly with regard to underground installations. Contractor work procedures are to account for the inaccuracy inherent in the representation of their location. Attention is directed to the possible existence of underground facilities not known to the Town.

New Hampshire State Law, RSA 374:48-56, requires that anyone who excavates in a public way or utility easement must notify the utility damage prevention system, DIG-SAFE, at least 72 hours prior to starting work.

The Contractor shall be responsible to notify the DIG-SAFE Call Center (Tel. No. 1-888-DIG SAFE (1-888-344-7233)) at least 72 hours in advance of starting any excavation or erecting permanent construction signing. Saturdays, Sundays, and legal holidays are not to be included in the computation of the required 72-hour notice. The Contractor shall provide the Engineer with the date, time, numbers assigned, and the name of the person answering the call at the DIG-SAFE Center. Notice of intent to excavate cannot be made more than 30 days prior to actual work. All utility facilities within the proposed Work, including advance construction sign locations, should be identified and marked prior to construction. Suspension of the Work for more than 30 days at any time will require re-notification of the DIG-SAFE Center to ensure validity of markings and to protect interim utility construction.

The Contractor shall provide sufficient lead time to allow for Contractor layout of advance permanent construction signs and excavation areas prior to the start of the 72-hour period required by DIG-SAFE. The Contractor shall additionally notify municipal and privately-owned utilities to identify, locate, and mark their facilities separately from those to be located through the DIG-SAFE system. Once located and marked, the Contractor shall maintain all utility markings and provide access to any and all installations to permit repairs and maintenance of service as needed.

The Contractor shall cooperate with utility owners in the removal and rearrangement of underground or overhead utility facilities to minimize interruption to utility services and duplication of work by the utility owners. Facilities or appurtenances that are to remain in place during construction shall be accounted for and protected by the Contractor's work procedures. The fact that an underground facility is not shown on the plans shall not relieve the Contractor of its responsibility under this Section. At points where the Contractor's operations are adjacent to properties of railway, telecommunications, gas, and electric power companies, and other utilities, or are adjacent to other property where damage might result in considerable expense, loss, or inconvenience, Work shall not commence until all arrangements necessary for the protection thereof have been made. The Town will notify all utility companies, pipe line owners, or other

parties affected by the Work and have all necessary adjustments of the public or private utility fixtures and appurtenances within or adjacent to the construction limits made as soon as possible.

In the event utility services are interrupted as a result of damage within the Limits of Construction, the Contractor shall notify the appropriate utility authorities and cooperate with them until service has been restored. Work shall not commence around fire hydrants until provisions for continued service have been made and approved by the local fire authority. Repairs to damaged utilities caused by carelessness or omissions on the part of the Contractor shall be corrected at the Contractor's expense. The damaged facilities shall be restored to a condition similar or equal to that existing before the damage occurred.

It is understood and agreed that the Contractor has considered in its bid all of the permanent and temporary utility facilities in their present or relocated positions as shown on the Plans and as evident on the site, and that no compensation will be allowed for any delays, inconvenience, or damage sustained due to any interference from such utility facilities or the operation of moving them. Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in protecting or repairing property as specified above shall be considered as included in the prices paid for the various Contract items of work and no compensation beyond the amounts provided for in the Contract will be allowed therefore. Should the Contractor desire to have any rearrangement made of any utility facility, or other improvement, for the Contractor's convenience in order to facilitate construction operations, which rearrangement is in addition to or different from, the rearrangements indicated in the Contract, the Contractor shall make whatever arrangements are necessary with the owners of such utility or other non-highway facility for such rearrangement and bear all related expenses. If utility facilities or appurtenances are found that are not noted in the Contract, the Engineer will determine whether adjustment or relocation of the utility is necessary to accommodate construction and proceed to make necessary arrangements with the utility owner or the Contractor if the work necessary is not otherwise specified. If the Contractor believes that it is entitled to compensation or a time extension based on the Engineer's determination or arrangements, then the Contractor shall proceed in accordance with the General Conditions provided herein.

SUPPLEMENTAL SPECIFICATION

COOPERATION BETWEEN CONTRACTORS

The Town reserves the right at any time to Contract for and perform other or additional work on or near the Work covered by the Contract. When separate Contracts are let within the limits of any one project or on adjacent projects, each Contractor shall conduct the Work without interfering or hindering the progress or completion of the work by other Contractors. Contractors working on the same project or adjacent projects shall cooperate with each other in a manner to serve the best interest of the State. In case of any unavoidable interference, the Engineer will determine priorities.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with the Contract and shall protect and save harmless the Town from damages or claims that may arise because of inconvenience, delays, or loss experienced because of the presence and operations of other Contractors working within the limits of the same project.

The Contractor shall arrange the Work and place and dispose of materials being used without interfering with operations of the other Contractors within the limits of the same project or on adjacent projects. The Work shall be coordinated with the work and sequence of other Contractors.

**It is expected that Liberty Utilities will be installing gas main extensions from the existing line under Ingham Road to Dawn Avenue, Sunset Drive, and Morningside Drive.
Final grading of the road shall not begin until gas line has been installed.**

SUPPLEMENTAL SPECIFICATION

SECTION 206 – STRUCTURE EXCAVATION

FOR PIPES AND OTHER MINOR STRUCTURES

Add 1.2:

This work shall also include excavation of test pits at locations where the proposed drain pipe and/or structures may be in conflict with existing utilities. After utility locations have been marked in the field by their respective owners but prior to installing any pipe or structures, the contractor shall determine locations of possible conflict. The contractor shall excavate a test pit at each such location and shall measure and record both the horizontal and vertical location of the utility. If a conflict is noted it shall be reported immediately to the Public Works Director or his designee to allow the Town to resolve the conflict.

Special Provisions

- Plug Existing RCP to be abandoned w/two courses of brick and mortar
- Removal of all CMP to be abandoned

Add to CB – Where small diameter pipes are connected to existing drainage structures, reconnect to proposed structures as directed by the Public Works Director or designee.

SUPPLEMENTAL SPECIFICATION

SECTION 403 --HOT BITUMINOUS PAVEMENT

Description

1.1 This work shall consist of constructing one or more courses of bituminous pavement on a prepared base as shown on the plans or as ordered. The methods may be classified as hand or machine, *or trench repair*.

1.1.1 Hand method shall include only the paving of raised islands, slopes, cattle passes, areas between rails at railroad crossings, existing sidewalks, drives, drive aprons, curb patch between concrete barrier and pavement, curb patch between granite curb and pavement, and paving of 50 tons (45 metric tons) or less added after the completion of paving operations.

1.1.1.1 *Trench Repair method shall include the placement of 3" of base pavement in two lifts over a prepared surface of the compacted drainage trench, matching with the existing pavement.*

1.1.2 Machine method shall include all paving not classified as hand method *or trench repair*.

1.2 When specified this work shall consist of constructing one or more courses of hot bituminous pavement using modifier to create higher strength.

1.3 This work shall consist of constructing bituminous pavement under nighttime operation and will be indicated in the item description. The location shall be as shown on the plan or as ordered.

Materials

2.1 Materials and their use shall conform to the requirements of 401.2.

2.2 Temporary bituminous pavement shall conform to 401, Table 1. Thickness shall be as shown on the plans or as ordered by the Engineer.

Construction Requirements

3.1 Construction requirements shall be as prescribed in 401.3.

3.2 For temporary pavement only, amend portions of 401.3.12 as follows:

3.2.1 The requirements of 401.12.1.1 shall apply except rolling may be accomplished with a dual vibrating steel drum roller.

3.2.2 Delete 401.3.12.2.

3.3 For temporary bituminous pavement only delete 401.13.7.

3.4 Temporary bituminous pavement shall be removed when no longer needed.

Methods of Measurement

4.1 Hot bituminous pavement will be measured as prescribed in 401.4, *except that Hot Bituminous Pavement, trench Repair will be measured by the square yard for material placed up to the limits shown in the plans on sheet D-1 for Typical Drainage Trench, table 2.*

4.1.1 Hot bituminous pavement, machine or hand method (night) will be measured in the same manner as 4.1. No separate measurement will be made for lighting necessary at the plant or at the site Hot Bituminous pavement transferred by the Material Transfer Vehicle (MTV) will be measured as prescribed in 401.4.

Basis of Payment

5.1 The accepted quantities of hot bituminous pavement, *machine or hand method* will be paid for at the Item Bid Price per ton (metric ton) for the bituminous mixture, complete in place. *The accepted quantities of hot bituminous pavement, trench repair will be paid for at the Item Bid Price per square yard.*

5.1.1 The accepted quantity of hot bituminous pavement, machine or hand method (night) will be paid for at the Contract unit price per ton (metric ton) complete in place.

5.1.2 No separate payment will be made for any costs of plant or project lighting, or overtime for night work needed due to night operations.

5.2 Bridge wearing course will be paid under machine method.

5.3 Hot bituminous bridge pavement, base course of the depth and additional materials specified is a final pay quantity item and will be paid for at the Contract unit price per ton (metric ton) in accordance with 109.11.

5.4 The accepted quantity of temporary bituminous pavement will be paid for at the Contract unit price per ton (metric ton) complete.

5.4.1 Removal of the temporary pavement will not be paid for under other items of the Contract but will be subsidiary.

SUPPLEMENTAL SPECIFICATION

SECTION 609 – CURBS

Add to 3.2.5

Bituminous curb shall be extruded to the shape and dimensions shown on the standard “Cape Cod Curb” detail in the Contract Drawing. The curb mold is CFD #1144 from Miller Spreaders.

Other curb dimensions will not be accepted without prior written approval of the Town.

SUPPLEMENTAL SPECIFICATION

SECTION 611 -- WATER MAIN INSTALLATION

Description

1.1 General Description of Work. The purpose of this work is to extend the water main/water service from Ingham Road to Sunset Drive, Dawn Avenue, and Highnoon Avenue in Merrimack, NH. The CONTRACTOR is responsible for furnishing and installing the new water mains and appurtenances in accordance with the plans and Merrimack Village District (MVD) specifications as specified herein or as ordered by the ENGINEER.

1.1.1 The Merrimack Village District or its Designated Agent, hereinafter called OWNER, together with the ENGINEER, will inspect, accept and/or reject work related to the water main herein specified.

1.1.2 The CONTRACTOR shall furnish all materials, labor, tools and equipment, and perform all operations, testing, and incidentals necessary for a complete operating water main installation, as outlined herein and on the plans.

1.2 Sequence/Maintenance of Service. The CONTRACTOR is responsible for maintaining continuous water service to affected customers except when construction requires an interruption of water service. A service interruption may last for a maximum of six hours. The CONTRACTOR must obtain written approval from the OWNER prior to interruption of water service to affected water users. The OWNER requires that a written notice be sent to all water customers 48 hours in advance of the scheduled shutdown. The OWNER will provide written notification, but it is the CONTRACTOR's responsibility to establish and address needs and coordinate with the ENGINEER and the OWNER.

1.3 Reference Drawings and Information. Neither the Town of Merrimack, hereinafter called TOWN, nor the OWNER guarantees the accuracy or completeness of existing conditions shown on the construction plans for this water main work. Sufficient investigations shall be made by the CONTRACTOR so that the CONTRACTOR is knowledgeable of existing conditions prior to tendering a bid.

1.3.1 The OWNER's Specifications for Water Main Installation, Extensions, Service, & Distribution System, dated March 10, 2008, and all supplements thereof is included herein by reference.

Materials

2.1 The CONTRACTOR shall provide the following material for the installation of the water mains, services, and appurtenances.

2.1.1 Common Backfill. Common backfill shall be granular material, consisting of hard sand and gravel so graded that, of the material passing the No. 4 (4.75 mm) sieve, not more than 35 percent shall pass the No. 200 (0.075 mm) sieve. Common backfill shall be free of organic matter, trash, roots or other deleterious material and shall contain no stone measuring greater in any dimension than two-thirds of the loose lift thickness or 8 inches (200 mm), whichever is smaller. Common backfill shall be capable of forming a firm, stable base when spread and compacted in accordance with this specification. In addition, common backfill shall be non-plastic (plasticity index zero, defined as liquid limit minus plastic limit). Common backfill may be obtained from either on-site excavations or off-site sources. Any materials excavated from the trench not conforming to this specification shall be disposed of as specified and replaced with approved material, as required, at no additional cost to the OWNER or NHDOT.

2.1.2 Sand Bedding and Blanket. Sand bedding and blanket material required for installation of the water mains, services, and appurtenances shall meet the following gradation requirements, 100% passing the 1/2" (12.5 mm) sieve and, of the material passing the #4 (4.75 mm) sieve, no more than 12% shall pass the #200 (0.075 mm) sieve.

2.1.3 Gravel Fill. Gravel fill shall consist of hard, durable gravel free from trash, organic matter, clay, surface coatings, and other deleterious materials. Gravel fill shall have a maximum stone size of two-thirds of the loose lift thickness or 6 inches, whichever is smaller. That portion passing the 4-inch (100 mm) sieve shall meet the following gradation requirements, as determined by ASTM C 136 and ASTM C 117:

<u>Sieve Size</u>	<u>Percent Passing</u>
6 inch (150 mm)	100
No. 4 (4.75 mm)	25-70
No. 200 (0.075 mm) *	0-12

* Based on fraction passing the No. 4 (4.75 mm) sieve.

2.1.3.1 When approved by the OWNER, gravel fill used for pipe bedding shall have a maximum stone size of 1-1/2 inches (37.5 mm).

2.1.4 Crushed Gravel. Crushed gravel shall consist of hard durable sand and gravel, free from trash, organic matter, clay, surface coatings, and other deleterious materials. Crushed gravel material shall meet the following gradation requirements, as determined by ASTM C 136 and ASTM C 117:

<u>Sieve Size</u>	<u>Percent Passing</u>
3 inch (75 mm)	100
2 inch (50 mm)	95-100
1 inch (25 mm)	55-85
No. 4 (4.75 mm)	27-52
No. 200 (0.075 mm)*	0-12

* Based on fraction passing the No. 4 (4.75 mm) sieve.

2.2 Water Mains and Appurtenances. All products and materials shall conform to the latest appropriate section of American Water Work Association (AWWA) and American National Standards Institute (ANSI) Standards and as otherwise specified hereinafter.

2.2.1 PVC Water Main Pipe:

2.2.1.1 Water pipe for permanent systems shall be C-900 PVC (polyvinyl chloride) pressure pipe conforming to AWWA and shall be UL and FM approved. Outside diameter shall be of standard ductile iron pipe. Use only lubricant that is specified by the pipe manufacturer.

2.2.2 PVC Fittings shall be "MJ" mechanical joint in nature and restrained via full pipe circumferential means.

2.2.3 Mechanical Joint Restraining Devices shall be used with all mechanical joints. Glands shall be manufactured of ductile iron conforming to ASTM A 536. The ring shall be grade 65-45-12 ductile iron in accordance with ASTM A 536. M.J. restraining devices shall be "Grip-Ring" as manufactured by Romec or approved equal.

2.2.4 Couplings shall be mechanical joint PVC solid sleeve type meeting the requirements stated above for PVC fittings.

2.2.5 Gate Valves shall be in accordance with AWWA C 509. Gate valves shall be resilient-wedge type with a non-rising bronze stem, 2-inch (50 mm) AWWA operating nut and fusion bonded epoxy coated both inside and out. Gate valves shall have mechanical joints as specified above. The valves shall be American Flow Control - 2500, or approved equal. Valves shall open right. Hardware shall be stainless steel.

2.2.6 Valve Boxes shall be heavy pattern cast iron, two piece, slip type, 5-inch (125 mm) shaft, with extension pieces sufficient to allow proper cover. The upper section of the box shall be top-flange type to prevent settlement. The lower section shall be belled type to enclose the operating nut of the valve. The cover shall be cast iron with the word "WATER" plainly cast thereon. Valve boxes shall be BUFFALO, TYLER, or approved equal.

2.2.7 Corporation Stops shall be ball valve type with a PTFE coated brass ball, CC (AWWA tapered) threads, double O-ring seal, blow-out proof stem design, and compression-type outlet connection with a grip joint. Corporation stops shall be Ford or approved equal.

2.2.8 Service Saddles shall be required for corporation stops in accordance with paragraph 3.7 herein. Service saddles shall be double strap type with 360° contact on the main. The body shall be constructed of nylon-coated ductile iron and the straps shall be stainless steel. Service saddles shall be Ford or approved equal.

2.2.9 Service Pipe for house services and chlorine injection points shall be C-900 copper tubing size (CTS) conforming to ASTM B 88. The name of trademark of the manufacturer and type shall be stamped at intervals along the pipe.

2.2.10 Curb Stops shall be ball valve type with a PTFE coated brass ball, CC (AWWA tapered) threads, double O-ring seal, blow-out proof stem design, and compression-type outlet connection with a grip joint. Curb stops shall be Ford or approved equal. No draining port.

2.2.11 Curb Boxes shall be adjustable in lengths consistent with pipe depths. Curb boxes shall be ERIE style with a 1/2"x 24" (12.5 mm x 600 mm) stainless steel rod and plug type cover with rope style threads.

2.2.12 Service Pipe Couplings shall be made of brass. Both ends of the coupling shall be compression type with a grip joint. Couplings shall be Ford or approved equal.

2.3 Concrete for thrust restraint shall be Class B in accordance with Section 520.

2.4 Trench insulation shall be rigid extruded polystyrene 8 feet long, 2 feet wide and 2 inches thick (2.45 m long, 0.6 m wide, 50 mm thick,) having an R value of 10 and conforming to ASTM C 578, Type VII, and shall be STYROFOAM HI-60 as manufactured by Dow Corning Chemical Co. or approved equal.

2.5 Pipe insulation shall be rigid polyurethane foam, 3-inch thickness, with density of 2.2 to 3.0 LBS/FT³, closed cell content 90% minimum (ASTM D2856).

2.5.1 Outer jacket shall be 22-gauge, galvanized, spiral lock seam outer cover. Jacket outer diameter shall be as required to support the water main piping complete with insulation specified. Jacket shall be furnished with stainless steel bands, Band-It clips, and fasteners to suit.

2.5.2 Fitting Insulation Kits shall consist of rigid polyurethane foam insulation complete with a thin elastomeric coating on the outside surfaces. Outer protective jacket to be fabricated galvanized steel and furnished with stainless steel bands, Band-It clips, and fasteners to suit.

2.6 AC Pipe Abatement

2.6.1 Polyethylene sheeting shall be at least 6-mil thickness.

2.6.2 Disposable bags and/or drums shall be of 6-mil polyethylene on which labels are directly printed as required by EPA, OSHA and DOT regulations.

2.6.3 Surfactant (wetting agent) shall be a 50/50 mixture of polyoxyethylene ether and polyoxyethylene ester, or equivalent, mixed in proportion of 1 fluid ounce to 5 gallons of water or as specified by the manufacturer.

Construction Requirements

3.1 General. The CONTRACTOR shall furnish all water main pipe, fittings, services and related material and appurtenances, labor, tools and equipment, granular material, and concrete; and perform all operations and incidentals necessary for complete excavation, installation, backfill, and testing as outlined herein and on the plans; and maintain service at all times.

3.1.1 The CONTRACTOR shall be responsible for the layout of the work. TOWN will provide control points as described in Section 105.08. The temporary and permanent water mains, service connections and appurtenances shall be built at the locations indicated on the plan to facilitate reconstructing other facilities within this area of the project.

3.1.2 The CONTRACTOR shall be responsible to field locate all existing water services for the purpose of connecting them to the proposed mains. This may involve exploratory test pits of which payment will be made under Item 206.19.

3.1.3 Consequential damages resulting from the CONTRACTOR not locating the facilities as shown on the plan are the responsibility of the CONTRACTOR.

3.1.4 The CONTRACTOR, at the completion of each part of the work, shall furnish the as-built locations of the water main and appurtenances referenced to NHDOT'S Construction Base Line and Bench Marks. The as-built locations shall be to an accuracy of plus or minus 0.10 feet (0.03 m) in plan and elevation.

3.1.5 Any deviations from the locations shown on the plans require the OWNER's and the ENGINEER's approval. Any discrepancies with locations shown on the plans will be brought to the ENGINEER's attention and subsequently resolved between the OWNER, the ENGINEER and the CONTRACTOR.

3.1.6 Deflection: Deflection of PVC pipe is not tolerated. Any and all changes in horizontal and/or vertical direction shall be accomplished using fittings.

3.2 Trench Excavation:

3.2.1 General. Excavation, dewatering, sheeting, and bracing shall be carried out in such a manner as to eliminate any possibility of undermining or disturbing the foundations of any existing structure, utilities or any work previously completed under this contract.

3.2.2 On paved surfaces that will not be resurfaced under this contract, the CONTRACTOR shall not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels which are so shaped as to cut or otherwise damage such surfaces during excavation or other phases of the work.

3.2.3 All lawns, paved surfaces, roadways, and structures which have been damaged or disturbed by the CONTRACTOR's operations outside of the project work areas shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations or as specified on the drawings.

3.2.4 The CONTRACTOR shall provide trench shoring and dewatering, if necessary, to provide a stable and dry trench at all times. The pipe trench must be dewatered to 1 foot 6 inches (0.5 m) below the invert of the new water main pipe. Trench width shall be 2 feet (0.6 m) plus the diameter of the pipe. Cover on pipe shall be a minimum of 5 feet 6 inches (1.7 m). Trench depth shall extend to 6 inches (150 mm) below the invert of the main.

3.2.5 As the excavation approaches pipes, conduits, or other underground structures, digging by conventional trenching machine methods shall be discontinued. Only manual methods of excavating shall be employed around buried utilities.

3.2.6 Prior to doing any work outside the right-of-way line on private property for connection of water services, the CONTRACTOR shall advise the property owner of the work and/or disturbance of the person's property that will be done, and the restoration thereof.

3.2.7 The CONTRACTOR shall maintain utilities, utility services and sewers encountered in the excavation, and repair or replace them to their owner's satisfaction and be responsible for consequential damages thereof.

3.2.8 The CONTRACTOR shall not be compensated for any additional work involved if a utility line, sewer or underground structure is in the trench line above or below the water main, except for common structure excavation if required.

3.2.9 Excavations shall be kept dry until the pipes and appurtenances to be built therein have been completed to such extent that they will not be damaged.

3.2.9.1 Provide, operate and maintain any dewatering system required to lower and control groundwater levels and groundwater hydrostatic pressure during the construction of the Work as required by this Section and the Contract Documents. The CONTRACTOR shall assume full responsibility and expense for the adequacy of the dewatering system with no additional time for performance.

3.2.9.2 The dewatering system shall be capable of developing an excavated subgrade relieved of any hydrostatic pressure that could cause a decrease in the stability of the excavated subgrade and which will provide the necessary groundwater control for the proper performance required for completion of the Work.

3.2.9.3 Dispose of subsurface water collected in a manner that conforms to all applicable local and state ordinances, statutes and laws.

3.2.9.4 Maintain continual and complete effectiveness of the dewatering system operation to provide a firm, stable, excavated subgrade at all times as required for proper performance of the Work.

3.2.9.5 Provide dewatering necessary to maintain the groundwater table 18 inches (450 mm) below the base of the proposed structure and/or pipe at all times.

3.2.9.6 Erosion Control. Provide adequate protection from erosion from any of the dewatering operations utilized during the course of the construction. Any damage, disruption or interference to newly constructed work or existing properties, buildings, structures, utilities and/or other work resulting directly or indirectly from dewatering operations conducted under this Contract shall be remedied by the CONTRACTOR, at no cost to the OWNER or NHDOT.

3.2.9.7 Treatment of Dewatering Operations Discharges. Provide such additional treatment devices as may be required to meet the provisions of the Contract. This may include the construction of sumps and/or settling basins, stone rip-rap, silt fences or other requirements. The treatment devices shall be later removed and/or filled in with acceptable backfill material, and restored to original conditions once they are no longer needed, at no additional cost to the OWNER or NHDOT.

3.2.10 Over-Excavation. If, in the opinion of the ENGINEER together with the OWNER, the material at or below the depth of the trench is unsuitable for foundation, it shall be removed to such depths as directed by the OWNER and ENGINEER and shall be replaced with Granular Backfill (sand), conforming to 209.2.1.1 and placed as provided in 209.3.

3.2.11 If the bottom of the excavation is deeper than the depth shown on the drawings, by error of the CONTRACTOR, the condition shall be corrected by refilling to the proper grade with compacted Granular Backfill (sand), conforming to 209.2.1.1. All costs shall be borne by the CONTRACTOR.

3.2.12 Rock and Boulder Excavation. Rock and boulder excavation shall be in accordance with "Section 206, Structure Excavation for Pipes and Other Minor Structures."

3.2.13 Excess and Unsuitable Excavation. Excess excavation that will not be used for backfill and unsuitable excavation shall be removed from the site and disposed of by the CONTRACTOR in accordance with local, state or federal regulations.

3.3 Trench Backfill:

3.3.1 General. After the pipe has been placed and has been inspected by the OWNER together with the ENGINEER, backfilling shall be performed without delay.

3.3.2 Bedding. Bedding shall meet the requirements of 2.1.2 and shall extend the full width of the trench from 6 inches (150 mm) below the pipe, to the springline of the

pipe. Compact the bedding material to 95% modified proctor (in accordance with ASTM D 157 and ASTM D 2922) prior to the placement of the blanket material.

3.3.3 Blanket. Blanket material shall meet the requirements of 2.1.2 and shall be placed from the springline of the pipe to a minimum of 12 inches (300 mm) above the pipe crown. The trench shall be backfilled by placing and compacting the sand in lifts of 6 inches (150 mm) or less. The blanket shall be carried up evenly on both sides of the pipe, so as not to disturb the pipe. Compact the blanket material to 95% modified proctor (in accordance with ASTM D 157 and ASTM D 2922) with approved hand-operated devices.

3.3.4 Backfill. Backfill material from 12 inches (300 mm) above the pipe to the underside of the pavement select material profile, or to the underside of loam and grassed areas, shall be backfilled with common backfill described herein and as approved by the ENGINEER.

3.3.4.1 Backfill shall be placed and compacted in layers of 6 inches (150 mm) or less. Compact the backfill material to 95% modified proctor (in accordance with ASTM D 157 and ASTM D 2922). Compaction shall be by hand-operated compactors or other approved method.

3.3.4.2 Jetting and bucket compaction are not acceptable means of compaction.

3.3.4.3 Trench areas improperly backfilled or having excessive settlement, as determined by the ENGINEER, shall be reopened to the required grade, backfilled using proper techniques, and repaved as necessary. The CONTRACTOR shall receive no additional compensation for repair of trenches constructed under this Contract.

3.4 Pipe Installation:

3.4.1 There shall be no physical connection between a public or private potable water supply system and a sewer, or sewer appurtenance which would permit the passage of any sewage or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole. Locate the new water main with a 10-foot (3 m) horizontal separation between it and the existing or proposed sewer main.

3.4.2 A deviation from the separation requirements of 3.5.1 above shall be allowed where necessary to avoid conflict with subsurface structures, utility chambers and building foundations, provided that the sewer is constructed as follows:

3.4.2.1 Sewer pipe shall be Class 52 ductile iron.

3.4.2.2 Joints shall be pressure tested with zero leakage at 25 psi (172 kPa) for gravity sewers, and at 1-1/2 times working pressure for force mains.

3.4.3 Whenever sewers must cross water mains, the sewer shall be constructed as follows:

3.4.3.1 Sewer pipe joints shall be located at least nine feet (2.7 m) horizontally from the water main.

3.4.3.2 Sewer pipe joints shall be pressure tested with zero leakage at 25 psi (172 kPa) for gravity sewers, and at 1-1/2 working pressure for force mains.

3.4.3.3 Vertical separation of the sewer and water main shall be not less than 18 inches (450 mm).

3.4.4 Piping in place shall be subject to inspection and approval of the ENGINEER together with the OWNER.

3.4.5 Pipe and accessories shall be kept in a sound, undamaged condition. They shall, at all times, be handled with care and shall not be dropped, dumped or bumped against any other object. Damaged material shall be replaced at no cost to NHDOT or OWNER, at any time during the construction that the damage is identified or occurs.

3.4.6 Pipe shall be stored off the ground.

3.4.7 Buried Pipe Installation. Installation of all buried piping shall be in accordance with AWWA Standard for installation of ductile iron water mains and their appurtenances, AWWA C 600.

3.4.8 Pipe and fittings shall be thoroughly cleaned before they are placed. All lumps, blisters, and excess coal tar coating shall be removed from the spigot and from the interior of the bell, and these surfaces shall be wire-brushed, wiped clean and dry, and be free from oil and grease before the pipe is laid.

3.4.9 The interior of pipe, fittings and valves shall be kept clean and free of foreign material or soils at all times during storage and installation, or the material may be rejected by the OWNER and ENGINEER.

3.4.10 All pipes and appurtenances laid in open trench excavation shall be bedded and uniformly supported over their full-length on bedding of the types specified herein and shown on the drawings. All work shall be performed in a dry trench.

3.4.11 At all times when pipe laying is not actually in progress, the open ends of pipe in the trench shall be closed by temporary water-tight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe has passed.

3.4.12 Pipe and fittings shall be laid accurately to the line and grades. Care shall be taken to provide a firm bearing for the pipe along its entire length. Pipes shall not be laid in water, nor shall water be allowed to flow through them.

3.4.13 Wherever it is necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, the amount of deflection allowed shall not exceed that

required for making a satisfactory joint and shall be subject to the approval of the OWNER and ENGINEER.

3.4.14 For mechanical joints, the spigot shall be centrally located in the bell, and adequate anchorage shall be provided at abrupt changes in direction and at dead-ends. All surfaces in contact with the rubber gaskets shall be brushed thoroughly with a wire brush immediately prior to assembly. The clean surfaces shall then be brushed with manufacturer's recommended lubricant prior to slipping the gasket over the spigot and into the bell. Lubricant shall also be brushed over the gasket prior to installation for the purpose of removing loose dirt and lubricating the gasket, as it is forced into its retaining space. The CONTRACTOR shall use wrenches as recommended by the manufacturer. When tightening bolts, it is essential that the gland be drawn toward the pipe flange evenly, maintaining approximately the same distance between the gland and the face of the flange at all points around the socket.

3.4.15 For push-on joints, all foreign matter in the gasket seat in the socket shall be removed and the gasket wiped clean and flexed before placing in its seat. A thin film of lubricant shall be applied to the inside surface of the gasket. The plain end of the next pipe, after wiping clean, shall be aligned and carefully entered into the socket until it just makes contact with the gasket. Joint assembly shall be completed by forcing the end of the pipe past the gasket until it makes contact with the bottom of the socket. Final joint assembly of pipe 8 inches (200 mm) and smaller shall be accomplished by pushing against the face of bell of the entering pipe with a crow-bar or other tool. For larger pipe, the assembly shall be made with a jack and suitable slings.

3.4.16 When pipe is cut in the field, the cut end shall be tapered back approximately 1/8" (3 mm) at an angle of 30 degrees with the centerline of the pipe with a coarse file or grinder to remove any rough edges which might injure the gasket.

3.4.17 The CONTRACTOR shall furnish and install all supports necessary to hold the piping and appurtenances in a firm, substantial manner at the lines and grades indicated on the drawings or as directed by the OWNER and ENGINEER.

3.4.18 Bends, tees, and other fittings in pipe lines buried in the ground shall be backed up with thrust restraint Class B concrete, 1/2 cubic yard (1/2 cubic meter) minimum, against undisturbed earth (bearing area as shown on the drawings). If the soil does not provide firm support, then bridle rods, clamps, etc. shall be provided to brace the fittings properly. All accessories shall be seal-coated thoroughly and heavily with an approved material per AWWA C 104 after assembly and shall be subsidiary to the ductile iron fitting unit price.

3.4.19 As shown on the drawings and as directed by the ENGINEER, insulation shall be installed over water mains having less than 5 foot 6 inches (1.7 m) cover. Limits of insulation shall be as shown on the drawings or as directed by the ENGINEER.

3.5 Valve Installation. Valves and boxes shall be set with the stem vertical and box vertically centered over operating nut. Valves shall be set on a firm foundation and supported by tamping selected excavated material under and at the sides of the valve. The gate box shall be supported during

3.6 Service Installation. Install corporation stops on the new water main. The tapping machine shall be rigidly fastened to the pipe halfway between the horizontal and vertical position. The length of travel of the tap should be established so that when the stop is inserted and tightened with a 14-inch (350 mm) wrench, not more than one to three threads shall be exposed on the outside. When a wet tapping machine is used, the corporation stop shall be inserted with the machine while it is in place. Stops shall be tightened only sufficiently to give water-tightness, and care must be constantly exercised not to over-tighten them.

3.6.1 Service saddles shall be required as indicated by the following chart:

<u>Pipe Size</u>	<u>Saddle Requirements for Class 52 D.I. Pipe</u>
6-inch (150 mm)	Taps > 1 inch (25 mm)
8-inch (200 mm)	Taps > 1 inch (25 mm)
10-inch (250 mm)	Taps > 1 inch (25 mm)

3.6.2 Install C-900 CTS, from the corporation stop to the curb stop, in a trench with a depth of at least 6 feet (1.8 m). Care shall be exercised in the placing and laying of copper tubing to be sure that the pipe does not have kinks. Place at least 6 inches of sand adjacent to and below the tubing and 12 inches (300 mm) above the tubing.

3.6.3 Install curb stops and curb boxes at the approximate property line, or as indicated on the drawings, and connect with new C-900 CTS coming from the new main. Place concrete block or flat stone beneath curb stop. Install curb box vertically centered over the operating key, with the elevation of the top adjusted to conform to the finished grade. Prior to backfilling, the CONTRACTOR shall ensure corporation stops are in the open position and curb stops are fully shut. Adequately support the box during backfilling to maintain vertical alignment. Care must be taken to ensure that the curb box does not rest on the curb stop.

3.6.4 Make connections of new C-900 CTS to existing services as directed by the ENGINEER. Connection shall be made using suitable couplings.

3.7 Inspection. Each section of installed water main will be visually inspected by the OWNER and ENGINEER. The pipe shall be true to both line and grade, shall contain no broken pipe, shall show no leaks, and shall contain no debris or other deposits of which shall in any way reduce the full cross-sectional area of the pipe.

3.7.1 Any section of water pipe which does not comply with these inspection criteria, as determined by the OWNER and ENGINEER, shall be promptly corrected,

replaced or repaired by the CONTRACTOR at no cost to the OWNER or NHDOT. Such methods as are employed for the correction shall be approved by the OWNER.

3.8 Pressure and Leakage Testing. The CONTRACTOR shall furnish all necessary equipment and labor for, and perform, pressure testing and leakage tests on the pipeline in accordance with AWWA C 600 Specifications.

3.8.1 The CONTRACTOR shall make any taps and furnish all necessary caps, plugs, etc., as required in conjunction with testing, and also furnish a test pump, gauges, and any other equipment required in conjunction with carrying out the hydrostatic tests. The CONTRACTOR shall at all times protect the new water mains and the existing water mains against the entrance of polluting material.

3.8.2 Testing Requirements:

1. Test duration: Two (2) hours, minimum.
2. Test pressure: One hundred and fifty percent (150%) of maximum operating pressure as determined by the ENGINEER or 100 psi (690 kPa) whichever is higher.
3. Allowable pressure loss: Pressure shall not vary more than 5 psi (34 kPa) for the duration of the pressure test.
5. Allowable leakage: Allowable leakage shall be determined by the following formula:

ENGLISH	METRIC
$L = \frac{SD(P)^{0.5}}{133200}$	$L = \frac{SD(P)^{0.5}}{715317}$
L = allowable leakage, in gallons per hour. S = length of pipe tested, in feet. D = nominal pipe diameter, in inches. P = average test pressure, in psi (gauge).	L = allowable leakage, in liters per hour. S = length of pipe tested, in meters. D = nominal pipe diameter, in mm. P = average test pressure, in kPa.

6. Acceptance of installation shall be determined on the basis of allowable leakage. If any test of pipe laid discloses leakage greater than that specified, the CONTRACTOR shall, at his own expense, locate and make repairs as necessary until the leakage is within the specified allowance.
7. All visible leaks are to be repaired regardless of the amount of leakage.
8. The leakage test shall be constructed concurrently with the pressure test.

3.9 Disinfection. Before being placed in service, all new and temporary water pipelines shall be chlorinated by the CONTRACTOR in accordance with the requirements of AWWA C 651. The procedure shall be discussed with the OWNER and ENGINEER prior to proceeding with the work.

3.9.1 The location of the chlorination and sampling points will be determined by the OWNER and ENGINEER in the field. Taps for chlorination and sampling shall be uncovered and backfilled by the CONTRACTOR, as required. The general procedure for chlorination shall be first to flush all dirty or discolored water from the lines, and then

introduce chlorine in approved dosages through a tap at one end, while water is being withdrawn at the other end of the line. The chlorine solution shall remain in the pipeline for a minimum of 24 hours.

3.9.2 Following the chlorination period, all treated water shall be flushed from the lines at their extremities, and replaced with water from the distribution system. Bacteriological sampling and analysis of the replacement water shall then be made after the replacement water has occupied the chlorinated pipeline for a minimum of 16 hours. Bacteriological analysis shall be completed by a state-certified laboratory in full accordance with AWWA C 651. The CONTRACTOR will be required to rechlorinate at no cost to the OWNER if the test fails to achieve satisfactory results. The line shall not be placed in service until the requirements of the NHDES, Water Supply Engineering Bureau are met.

3.9.3 Special disinfection procedures, such as soaking or swabbing approved by the ENGINEER, shall be used in connections to existing mains and where the method outlined above is not practical.

3.10 Spare Parts. The CONTRACTOR will be required to have on-site, at all times, the following spare parts:

11 1/4° bends	2 for each size pipe
22 1/2° bends	2 for each size pipe
45° bends	2 for each size pipe
Solid sleeve couplings	2 for each size pipe
DI CL 52 pipe	2 lengths of 6" (150 mm)
Dresser couplings	2 for each size pipe
Retainer glands	2 for each size pipe

3.12 AC Pipe Removal. Before any work commences, post danger signs in and around the work areas to comply with Federal, State, and local law. Regulate area access to authorized, trained, accredited and protected personnel. The CONTRACTOR shall be responsible for taking whatever steps necessary to prevent release to the environment and additional contamination of the areas beneath the AC pipe.

3.12.1 Cutting of existing AC pipe shall be minimized and performed in accordance with all applicable standards and shall minimize the release of AC fibers. Install sheeting beneath the AC pipe to minimize contamination of adjacent soil. All surfaces shall be wetted during removal activities. AC pipe shall be removed in sections in an "intact" condition such that it can be handled without breakage.

3.12.2 AC pipe shall be secured, wrapped, and disposed of in a timely manner. Stockpiling of removed pipe in an unsecured area shall not be allowed.

3.12.3 AC pipe shall be transported to a licensed facility for proper disposal. Crushing of pipe in-place shall not be allowed.

3.12.4 After removal of the AC pipe has been completed, the entire area shall be thoroughly cleaned before removal of barriers. All plastic barriers, tapes, and disposal contaminated equipment shall be disposed of as asbestos waste. All reusable equipment shall be thoroughly decontaminated through wet cleaning and sealed within 6-mil polyethylene bags before removal from work area.

Method of Measurement

4.1 Pipe of the kind, type and size specified will be measured by the linear foot (linear meter) to the nearest 0.1 foot (meter) of furnished and installed and operational water main. Measurements will be taken along the centerline of the pipe, end to end, with no deductions for any valves and fittings.

4.2 Water main bridge crossing, including pipe of the kind, type and size specified, fittings, fabrications, supports, and insulation shall be measured by the unit from the back wall of abutment A to the back wall of abutment B.

4.3 Valves, fittings, chlorine injection taps, corporation stops, and curb stops will be measured by the each for the number of units furnished and installed.

4.4 Water main insulation will be measured by the square yard (square meter) to the nearest 0.1 of a square yard (square meter) of area covered. When more than one 2 in (50 mm) layer is specified, each layer will be measured.

4.5 The ENGINEER must be involved in and approve of the measurement of any pay item.

Basis of Payment

5.1 The accepted quantity of ductile iron and copper pipe will be paid for at the contract unit price per linear foot (linear meter) of the kind, type, and size specified complete in place, with the following stipulations:

5.1.1 Common structure excavation required for the removal of unsuitable material below the typical trench section will be paid for as provided in 206.

5.1.2 All rock structure excavation, any common structure excavation exploratory and any common structure excavation below the depth specified in 206.4.1.1 shall be paid as provided in 206.

5.1.3 Granular backfill (sand), to replace material excavated under 5.1.1 only, will be paid as provided in 209.

5.2 The accepted quantity of water main bridge crossing, including pipe shall be paid at the contract price per unit complete in place as shown on the plans and specified herein, and shall include furnishing and installing pipe, insulation, hangers, insulation protection shield, rollers and fittings, expansion joints and all other work required for or incidental to the completion of this item.

5.3 The accepted quantity of valves, fittings, chlorine injection taps, corporation stops, and curb stops will be paid for at the contract unit price of each of the kind, type, and size specified complete in place.

5.4 Excavation, bedding, sheeting and shoring, dewatering, concrete thrust blocks, thrust restraining systems, restoration of existing service connections, MJ glands, valve boxes, pressure testing, disinfection, flushing, maintaining water service, abandonment of existing water pipe, removing and stacking existing hydrants, couplings, connections to existing water mains, backfill, temporary trench pavement repair, removal and decommissioning of temporary water system, restoration of property, utilities, loam and seed, as-built drawings, and any other work necessary or required for a complete operational water main relocation shall be subsidiary to the pipe, valves, fittings, chlorine injection taps, corporation stops, service pipe, curb stops and hydrants.

5.5 The accepted quantity of water main insulation, including excavation and backfill, will be paid for at the Contract unit price per square yard (square meter), complete in place.

5.6 AC pipe removal, handling, and disposal shall be subsidiary to the completion of the water main system.

Pay items and units (ENGLISH):

611.1008	8" PVE Water Pipe	LF
611.52007	3/4" Curb Stop	EA
611.6002	2" HDPS Water Pipe	LF
611.70008	8" Fitting	EA
611.71002	2" Gate Valve	EA
611.71008	8" Gate Valve	EA
611.7302	2" Blow Off	EA
611.8101	Hydrant, Including Lateral and Valve	
EA		
611.90001	Adjusting Water Gates And Shutoffs Set By Others	EA
611.90002	Tapping Existing Main	EA

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 612 -- SANITARY SEWER INSTALLATION

Description

1.1 General Description of Work. This work shall consist of installing PVC Sewer at locations specified in the plans for Ingham Road, Sunset Drive, Dawn Avenue, Highnoon Avenue, and Morningside Drive. The CONTRACTOR shall furnish and install gravity sanitary sewer main, force sewer main, sewer manholes, sewer pump stations, excavation, bedding, backfill, as shown on the plans and specified herein. The CONTRACTOR shall be responsible for supplying and installing the new sewer main piping and appurtenances in accordance with the plans and specifications or as ordered by the Engineer.

1.1.2 The Town of Merrimack, NH or its Designated Representative, hereinafter called OWNER, together with the ENGINEER, will inspect, accept, and reject work related to the sanitary sewer installation herein specified.

1.1.3 The CONTRACTOR shall furnish all materials, labor, tools, and equipment and perform all operations, testing, and incidentals necessary for a complete sewer installation as shown on the plans and specified herein. Pump Systems, Inc. of Franklin NH (PSI) will supply key components for the pump stations as noted in the materials section of this special provision and perform installation of some components of the pump stations as noted in the construction section of this special provision. Bidder shall contact Nick Buchinger of PSI at (603) 934-7100, Nick@pumpsystemsinc.com to coordinate pricing and schedules.

1.2 Reference Drawings and Information. The plans indicate, in general, the alignment and finished grade elevation and underground utility and piping invert grades. The ENGINEER may make such adjustments in grade and alignment, as are necessary, in order to avoid interference and to adapt the piping to other special conditions encountered. All locations of existing pipes, utilities, etc., shall be verified by the CONTRACTOR with the proper authority. Neither the OWNER nor the ENGINEER guarantees the accuracy or completeness of the existing conditions shown on the construction plans. Cover over pipes shall conform to requirements of the New Hampshire Department of Environmental Services (NHDES).

1.3.1 Sufficient investigations shall be made by the CONTRACTOR so that the CONTRACTOR is knowledgeable about existing conditions prior to tendering a bid.

Materials

2.1 Materials. The CONTRACTOR shall provide the following material for the installation of the sewer mains, manholes services, pump stations, and appurtenances.

2.1.1 Common Backfill. Common backfill shall be granular material consisting of hard sand and gravel so graded that, of the material passing the No. 4 (4.75 mm) sieve, not more than 35% shall pass the No. 200 (0.075 mm) sieve. Common backfill shall be free of organic matter, trash, roots or other deleterious material and shall contain no stone measuring greater in any dimension than two-thirds of the loose lift thickness, or 8 in (200 mm), whichever is smaller. Common backfill material shall be capable of forming a firm, stable base when spread and compacted in accordance with this specification. In addition, common backfill shall be non-plastic (plasticity index zero, defined as liquid limit minus plastic limit). Common backfill materials may be obtained from either on-site excavations or from off-site sources. Any materials excavated from the trench and not conforming to this specification shall be disposed of as specified and replaced with approved material, as required, at no additional cost to the OWNER or NHDOT.

2.1.2 Sand Blanket Material. Sand blanket material required for installation of the sewer mains, services, and appurtenances shall meet the following gradation requirements, 100% passing the ½ in (12.5 mm) sieve and, of the material passing the #4 (4.75) sieve, no more than 12% passing the #200 (0.075 mm sieve).

2.1.3 Gravel Fill. Gravel fill shall consist of hard, durable gravel free from trash, organic matter, clay, surface coatings, and other deleterious materials. Gravel fill shall have a maximum stone size of two-thirds of the loose lift thickness, or 6 in (150 mm), whichever is smaller. That portion passing the 4 in (100 mm) sieve shall meet the following gradation requirements, as determined by ASTM C 136 and ASTM C 117:

<u>U.S. Sieve Size</u>	<u>Percent Passing</u>
6 in (150 mm)	100
No. 4 (4.75 mm)	25-70
No. 200 (0.075 mm) *	0-12

* Based on fraction passing the No. 4 (4.75 mm) sieve.

2.1.4 Crushed Gravel. Crushed gravel shall consist of hard durable sand and gravel, free from trash, organic matter, clay, surface coatings, and other deleterious materials. Crushed gravel material shall meet the following gradation requirements, as determined by ASTM C 136 and ASTM C 117:

<u>U.S. Sieve Size</u>	<u>Percent Passing</u>
3 inch (75 mm)	100
2 inch (50 mm)	95-100
1 inch (25 mm)	55-85
No. 4 (4.75 mm)	27-52
No. 200 (0.075 mm)*	0-12

* Based on fraction passing the No. 4 (0.075 mm) sieve.

2.1.5 Bedding. Bedding shall be crushed stone conforming to ASTM C 33 stone size No. 67 gradation requirements.

2.2 Sanitary Sewer. All products and materials shall conform to the latest ASTM, ANSI or other appropriate standard and as otherwise specified herein.

2.2.1 Gravity Polyvinyl Chloride Pipe shall be SDR-35, push-on joint conforming with ASTM D 3034. Fittings shall comply with ASTM D3034. Joints shall comply with ASTM D 3212.

2.2.1.1 Each length of pipe shall have an integral bell and shall be supplied in 12.5 ft (3.81 m) lengths.

2.2.1.2 Joint shall be push-on type using elastomeric gasket designed to prevent slipping during jointing. The gaskets shall be factory installed and secured in place prior to delivery to the job site.

2.2.1.3 Wye branch connections shall be supplied for service connections.

2.2.1.4 All pipe, fittings, gasket material and lubricant shall be supplied by the same manufacturer. Petroleum base lubricants shall not be used.

2.2.1.5 Physical and chemical properties of pipe couplings shall be equal to those properties of the pipe.

2.2.2 Mechanical Joint Ductile Iron Pipe for use on bridge crossings shall conform to ANSI A21.51/AWWA C 151 Class 52. Mechanical joint fittings shall be ductile iron conforming to ANSI A21.10/AWWA C 110. Pipe and fitting joint shall meet ANSI A21.11/AWWA C 111 standards and shall include plain rubber gaskets. Pipe and fittings shall be double cement lined and seal coated inside and outside in accordance with ANSI A21.4/AWWA C 104. All pipe and fittings shall be furnished with ductile iron retainer glands.

2.2.3 Push-On Type Ductile Iron Pipe shall be ductile iron complying with ANSI A21.51 and AWWA C 151, Class 52. Pipe shall be double cement-lined 1/8 in (3 mm) thick and seal coated inside and out in accordance with ANSI A21.4 and AWWA C 104. Joints shall be rubber gasket, push-on type in accordance with ANSI A21.11 and AWWA C 111. Use only lubricant that is specified by the pipe manufacturer.

2.2.4 Flexible Couplings and Transition Couplings for non-pressure sewer pipe shall be resilient elastomeric plastic with recessed stainless steel bands at each end for fastening.

2.2.5 Couplings used to join plain ends of PVC pipes shall be PVC double bell couplings which shall conform to ASTM D 3034 for materials and ASTM D 3212 for joints.

2.2.6 Identification: Each pipe length and fitting shall be clearly marked with:

- 2.2.6.1 Manufacturer's name and trademark.
- 2.2.6.2 Nominal pipe size with sidewall dimension ratio.
- 2.2.6.3 Material designation.

2.3 Precast Concrete Manholes.

2.3.1 Materials:

- 2.3.1.1 Cement: ASTM C 150, Portland Type II
- 2.3.1.2 Fine and coarse aggregates: ASTM C 33
- 2.3.1.3 Water: Fresh, clean and potable.
- 2.3.1.4 Reinforcing steel: ASTM A 615, Grade 60.
- 2.3.1.5 Welded wire Fabric: ASTM A 185

2.3.2 Precast Manhole Sections:

- 2.3.2.1 Precast manhole structures shall be capable of supporting H-20 loads.
- 2.3.2.2 Cone sections shall be eccentric.
- 2.3.2.3 In lieu of a cone section, when manhole depth is less than 6 feet (1.8 m), a reinforced concrete slab cover shall be used, having an eccentric entrance opening.
- 2.3.2.4 The base section shall be monolithic to a point at least 6 in (150 mm) above the openings cast to receive the sewer lines. For drop manholes, any opening shall be a minimum of 6 in (150 mm) from any joint.

2.3.3 Manhole Joints and Pipe Seals.

2.3.3.1 Horizontal joints between precast manhole sections shall be tongue and groove as shown on the Drawings and shall have a mastic-like sealant such as Ram-Nek, Kent Seal No. 2 or a butyl rubber joint gasket (O-ring) conforming to ASTM C 443. All horizontal joints shall be watertight in accordance with the testing requirements of this Section.

2.3.3.2 Pipe to manhole joints shall be an embedded flexible rubber boot or as shown on the Drawings. Nonshrinking mortar or grout is not acceptable. Pipe to manhole connections and joints shall be watertight in accordance with the testing requirements of this Section.

2.3.4 Waterproofing.

2.3.4.1 All manholes shall be waterproofed, at the factory, with two seal coats applied to the exterior of the manhole in accordance with the seal coating manufacturer's recommendations. Waterproofing shall be masonry seal MSP-1 waterproofing material as made by the Masonry Seal Corporation, 7500 West Ridge Road, Elyria, Ohio, or Foundation Coating 47-461 as made by TNEMEC.

2.3.4.2 Exterior of all joints shall be filled with hydraulic cement and then coated with waterproofing after setting.

2.3.5 **Brick Masonry** for Inverts and Grade Adjustment: ASTM C 32, Grade SS.

2.3.6 **Mortar.**

2.3.6.1 Masonry Cement: ASTM C 150 (Type II).

2.3.6.2 Aggregate for Masonry Mortar: ASTM C 144.

2.3.6.3 Hydrated Lime for Masonry Purposes: ASTM C 207.

2.3.6.4 Mortar for Unit Masonry: ASTM C 270, Type S.

2.3.6.5 Premixed Materials: ASTM C 387.

2.4 **Sewer Manhole Frames and Covers.**

2.4.1 **General.**

2.4.1.1 The castings shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined at the foundry, before shipment to prevent rocking of covers in any orientation.

2.4.1.2 All castings shall be thoroughly cleaned and subject to a careful hammer inspection.

2.4.1.3 Castings shall be at least Class 30 conforming to the ASTM A 48.

2.4.1.4 All castings shall be heavy duty suitable for H-20 loadings.

2.4.2 **Manhole frames and covers** shall provide 30 in (750 mm) diameter clear opening. The cover shall have the word "SEWER" in 3 in (75 mm) letters cast into a diamond design top surface.

2.5 **Pump Station**

2.5.1 Pump Discharge Components

1. The Conery BERS Universal Rail System non-corrosive base shall allow for easy installation and removal of submersible pumps. The system shall have a stationary element fixed to the basin and a removable element allowing for installation and maintenance of the pump.
2. Pump Disconnect: Pump disconnect shall be made of stainless steel and cast iron and shall utilize an O-ring seal between the pump disconnect and rail base assembly.
3. Discharge Piping: Discharge piping and fittings shall be made of Schedule 40 304 stainless steel and cast iron on the pump side of the disconnect. Discharge pipe and fittings on the stationary side of disconnect shall be made of SCH80 PVC.
4. Guide Rails: Support Bracket Guide rails shall be of welded design and constructed of Schedule 40 304 stainless steel pipe. Guide rail support brackets shall be constructed of 304 stainless steel.
5. Check Valves: Check Valve Check valve shall be of swing type design with a rating of 200psi WOG and constructed of cast brass to prevent corrosion.
7. Shut Off Valve: Shut off valves shall be an American Granby HMIP300SE schedule 80 PVC ball isolation valve utilizing solvent welded connections.

2.5.2 Accessories

1. Float Bracket: Float Bracket shall be manufactured from 304 stainless steel and capable of supporting 4 floats.
2. Junction Box: Junction box shall be a corrosion resistant stainless steel enclosure of NEMA 4X design with a gasketed cover.
3. Hardware: All fasteners shall be made of 300 series stainless steel.
4. Pump Lifting Components: Lifting chains links shall be 1/4" in diameter. Both lifting shackles and lifting chains shall be made of 300 series stainless steel.
5. Utility Backboard: Utility backboard shall be constructed of treated pine with a usable space of 3 feet high by 5 feet wide or as directed by site supervision. The backboard shall be constructed of 5/4 decking with legs made of 4x4 post.

2.5.3 Basin Specification

The sewage pump basin as manufactured by Jackel Incorporated shall include an integral anti-flotation ring. The basin shall be 60 inches in diameter and 168 inches in length.

1. Standards: The basin shall be manufactured to the ASTM D 3753: Standard Specification for Glass-Fiber-Reinforced Polyester Manholes and Wet wells.
3. Resin: The resins used shall be commercial grade polyester and shall be evaluated by a laminate test or determined by previous service to be acceptable for the intended environment.
4. Glass Fiber: The reinforcing material shall be a commercial grade of glass fiber (continuous strand, chopped strand, continuous mat and/or non-continuous mat) having a coupling agent, which will provide a suitable bond between the glass reinforcement material and resin.
5. Wall Thickness: The wet well fiberglass reinforced polyester wall laminate shall be designed to withstand wall collapse or buckling based on:
 - Hydrostatic pressure of 62.4 lbs. per square foot
 - Saturated soil weight of 120 lbs. per cubic foot
 - Soil modulus of 700 lbs. per square foot

- Meets or exceeds pipe stiffness values as specified in ASTM D3753
6. **Fiberglass Reinforced Polyester Laminate:** The wet well fiberglass reinforced polyester laminate is constructed to withstand or exceed two times the assumed loading on any depth of wet well.
The finished fiberglass reinforced polyester laminate shall have a Barcol hardness of at least 90% of the resin manufacturer's specified hardness for the fully cured resin. The Barcol hardness shall be the same for both the interior and exterior surfaces.
7. **Basin Bottom:** The basin bottom shall be of sufficient thickness to withstand applicable hydrostatic uplift pressure. In saturated conditions, the center deflection of the empty basin bottom shall be less than 3/8" (elastic deflection) and shall not interfere with bottom pump mounting requirements or operation of the system.
8. **Basin Top:** The wet well top flange (cover flange) shall have an outside diameter 2 inches (min.) greater than the inside diameter of the wet well. A four or six bolt pattern shall accommodate the mounting of an aluminum cover manufactured of aluminum and shall include a lockable hatch. The cover shall attach using 300 series Stainless Steel fasteners and non-corroding threaded inserts, fully encapsulated with non-continuous mat or chopped-strand glass strand reinforcement. The inserts shall have an offset tab to prevent stripping or spinning out when removing and reinserting cover fasteners.

2.5.4 Pumps

1. Provide FM explosion proof submersible grinder sewage pumps suitable for continuous duty operation underwater without loss of watertight integrity to a depth of 65 feet. Unit shall be designed with a grinder system to macerate material found in normal domestic and commercial sewage including reasonable amounts of wood chips, plastics, disposable diapers, sanitary napkins etc., to a fine slurry. The pump design shall be such that the pump will be automatically connected to the discharge piping when lowered into place on the lift out system base. The pump shall be easily removable for inspection or service, requiring no bolts, nuts, or other fasteners to be disconnected, or the need for personnel to enter the wet well. The motor and pump shall be designed, manufactured, and assembled by the same manufacturer.

2. **Manufacturer:**

EBARA Fluid Handling
1651 Cedar Line Drive
Rock Hill, SC 29730

3. **Pump Characteristics:** Pumps shall conform to the following requirements:

Number of units: **2**

Design flow (gpm): **66**

Design TDH (ft): **88**

RPM: **3600**

Maximum HP: **5**

Voltage: **230V**

Phase: **1**

4. **Pump Construction:** All major parts of the pumping unit(s) including casing, impeller, motor frame and discharge elbow shall be manufactured from gray cast iron, ASTM A-48 Class 30. Castings shall have smooth surfaces devoid of blow holes or other casting

irregularities. Casing design shall be centerline discharge with a large radius on the cut water to prevent clogging. Units shall be furnished with a discharge elbow and 125 lb. flat face ANSI flange.

All exposed bolts and nuts shall be 304 stainless steel. All mating surfaces of major components shall be machined and fitted with NBR o-rings where watertight sealing is required. Machining and fitting shall be such that sealing is accomplished by automatic compression of o-rings in two planes and o-ring contact is made on four surfaces without the requirement of specific torque limits. Internal and external surfaces are prepared to SPPC-VISI-SP-3-63 then coated with a zinc-chromate primer. The external surfaces are then coated with a H.B. Tnemecol 46-465 Coal Tar paint.

Impeller design shall be a recessed, semi-vortex, multi-vane design. It shall include back pump out vanes to reduce the pressure and entry of foreign materials into the mechanical seal area. Impellers shall be direct connected to the motor shaft with a slip fit, key driven, and secured behind the rotary grinder impeller and nut.

The grinder system shall consist of stationary cutter ring and rotary grinder impeller, each manufactured of a chrome alloy cast iron with a minimum hardness of HRC 60. The rotary grinder impeller shall be direct connected to the motor shaft with a slip fit, key driven, and secured with an impeller nut. The pump suction shall be machined to accept the stationary cutter ring which is held in place by a disk cover plate which bolts to the casing.

Double mechanical seals operating in an oil bath shall be provided on all units. The oil filled seal chamber shall be designed to prevent over-filling and include an anti-vortexing vane to insure proper lubrication of both seal faces. Face materials shall be carbon/ceramic for the upper seal and silicon carbide for both lower seal faces. The elastomers shall be of NBR material and hardware shall be 304SS. Seal system shall not rely on pumping medium for lubrication.

2.5.5 Controls

1. Enclosure: The pump controls shall be contained in a NEMA type 4X enclosure manufactured of fiberglass with a stainless steel padlocking hasp and door hinge. A painted steel back panel shall be provided in the control enclosure to mount circuit breakers, starters, relays and other control equipment. The enclosure shall contain a full inner-door with lift off hinges for mounting lights and switches and to protect the operator from high voltage.

2. Electrical Service: The incoming power shall be 230volts, single phase, 60 hertz. The control voltage shall be 115 volts, 1 phase, 60 hertz. A control transformer shall be provided in the control panel to provide 115 volt control power when necessary. The transformer must be properly sized to handle the maximum load of the control.

3. Power Terminal Blocks: The control panel shall contain terminals for field wiring of the utility power, pump motors, pump sensors and level control equipment. They shall be sized per NEC requirements and shall be as manufactured by Marathon Products, Inc. or equal.

4. Circuit Breakers/Fuses: Circuit breakers shall be provided for each pump. A separate circuit breaker shall be provided for the control circuit. All circuit breakers shall be

thermal magnetic type and be sized per NEC requirements. Separate control and alarm fuses must be provided in the control panel.

5. Starters: A properly sized IEC rated starter shall be provided for each pump. Definite purpose contactors with overload shall not be acceptable. The overload shall be Class 10 ambient compensated type rated and shall be capable of being manually reset. The starters shall be "XT" series as manufactured by Cutler-Hammer or equal.

6. Controller: The control panel will be operated by four float switches located in the wet well. A solid-state alternator, as manufactured by Ohio Electric Control, Inc., shall be provided to alternate pumps on each pumping cycle. The control shall include circuitry that will start the second or lag pump if the inflow is greater than one pump can handle. In this instance, both pumps shall run until the level drops below the "off" float.

7. Light and Switches: A separate run light and hand-off-auto switch shall be provided for each pump. The lights and switches must be mounted to the full inner-door.

8. SCADA Provisions: The control panel shall include the following provisions for future installation (by others) of a SCADA system:

- An additional 8"x11" space reserved for future SCADA components.
- (1) 115 volt duplex GFCI receptacle mounted inside of the control panel sub door.
- (5) Dry contacts to be activated by power failure, heat sensor, seal fail, pump fail, and high level alarm.

9. Pump Sensors: Each pump shall contain sensors for over-temperature (heat sensor) and seal failure (probe). The heat sensor shall stop the corresponding pump upon activation of the pump thermal switches. The pump shall restart automatically when it cools. A probe in the pump shall detect moisture leakage through the pump seal. Relays in the control panel shall work in conjunction with the probes to detect moisture in the pump. Upon occurrence of moisture in the pump seal, an indicator light mounted on the full inner-door of the control panel shall be illuminated. The seal fail lights shall be oil-tight, NEMA 4X rated as manufactured by IDEC Corporation or equal.

10. Alarm: A visual flashing alarm shall be mounted to the top, exterior of the control panel. The visual alarm shall be rated NEMA 4X and shall be one as manufactured by Ohio Electric Control, Inc.

11. Level Control: The pumps control panel will be operated by four (4) float switches located in the wet well. The levels will correspond as follows:

1. Both Pumps Off
2. Lead Pump On
3. Lag Pump On
4. High Level

The floats switches shall be Conery 2900 series mechanical float switches with weights. The floats shall be mounted inside the wet well by a stainless steel float bracket.

12. Labeling: Each component mounted on the inner-door will be labeled with a plastic engraved nameplate. The back panel will be labeled with laminated paper labels.

13. Wiring: All wiring shall be sized according to NEC/UL and shall be placed in plastic wireway or similar devices.

14. Compliance: The control panel must comply with the National Electric Code including a listing of the panel short circuit protection. The control panel shall be certified as UL 508A approved.

2.5.6 Miscellaneous

1. All conduit, wiring and other appurtenances necessary for the function of the pump station shall be in accordance with PSNH and PSI specifications. Asphalt pad (403.12), Concrete Generator Pad (520.1), Crushed Gravel (304.2), and Fencing (607.36, 607.436, 607.73612) shall be in accordance with specification numbers provides.

Construction Requirements

3.1 General. The CONTRACTOR shall furnish all sanitary sewer pipe, fittings, services and related material and appurtenances, labor, tools and equipment, granular material, and concrete; and perform all operations and incidentals necessary for complete excavation, installation, backfill and testing, as outlined herein and on the plans; and maintaining service at all times.

3.1.1 The CONTRACTOR shall be responsible for the layout of the work. OWNER will provide control points as described in Section 105.08. The sanitary sewer and appurtenances shall be built at the locations indicated on the plan to facilitate reconstruction of other facilities within this area of the project.

3.1.2 The CONTRACTOR shall be responsible to field locate all existing sewer service laterals for the purpose of connecting them to the proposed sewer. This may involve exploratory test pits of which payment will be made under Item 206.19.

3.1.3 Consequential damages resulting from the CONTRACTOR not locating the facilities as shown on the plan are the responsibility of the CONTRACTOR.

3.1.4 Location of new sewer services for all lots throughout the project area as part of the new sewer line will be as determined by the OWNER and ENGINEER.

3.1.5 The CONTRACTOR, at the completion of each part of the work, shall furnish the as-built locations of the sewer main, and appurtenances referenced to the Construction Base Line and Bench Marks. The as-built locations shall be to an accuracy of plus or minus 0.10 feet (0.03 m) in plan and elevation.

3.1.6 Any deviations from the locations shown on the plans require the OWNER's and ENGINEER's approval. Any discrepancies with locations shown on the plans will be brought to the ENGINEER's attention and subsequently resolved between the OWNER, the ENGINEER and the CONTRACTOR.

3.2 Trench Excavation

3.2.1 General - Excavation, dewatering, sheeting, and bracing shall be carried out in such a manner as to eliminate any possibility of undermining or disturbing the foundations of any existing structure, utilities or any work previously completed under this contract.

3.2.1.1 All lawns, paved surfaces, roadways, and structures which have been damaged or disturbed by the CONTRACTOR's operations outside of the project work areas shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations or as specified on the drawings.

3.2.1.2 On paved surfaces that will not be resurfaced under this contract, the CONTRACTOR shall not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels which are so shaped as to cut or otherwise damage such surfaces during excavation or other phases of the work.

3.2.2 Execution - The CONTRACTOR shall provide trench shoring and dewatering, if necessary, to provide a stable and dry trench at all times. The pipe trench must be dewatered to 1 foot 6 in (0.5 m) below the invert of the new sewer pipe. Trench width shall be 2 feet (0.6 m) plus the diameter of the pipe or a minimum of 3 feet (1 m), whichever is greater. Cover on the gravity sewer pipe shall be a minimum of 6 feet (1.8 m) or as shown on the contract drawings. Trench depth shall extend to 6 in (150 mm) below the invert of the main.

3.2.2.1 As the excavation approaches pipes, conduits, or other underground structures, digging by conventional trenching machine methods shall be discontinued. Only manual methods of excavating shall be employed around buried utilities.

3.2.2.2 Prior to doing any work outside the right-of-way line on private property or disturbing private property, the CONTRACTOR shall advise the property owner of the work and/or disturbance of the person's property that will be done, and the restoration thereof.

3.2.2.3 The CONTRACTOR shall maintain utilities, utility services and sewers encountered in the excavation, and repair or replace them to their owner's satisfaction and be responsible for consequential damages thereof.

3.2.2.4 The CONTRACTOR shall not be compensated for any additional work required in working in close proximity to a utility line, sewer, water or underground structure in the trench line above or below the sewer pipe.

3.2.2.5 Excavations shall be kept dry until the pipes and appurtenances to be built therein have been completed to such extent that they will not be damaged.

3.2.2.5.1 Provide, operate and maintain any dewatering system required to lower and control groundwater levels and groundwater hydrostatic pressure during the construction of the Work as required by this Section and the Contract Documents. The CONTRACTOR shall assume full responsibility and expense for the adequacy of the dewatering system with no additional time for performance.

3.2.2.5.2 The dewatering system shall be capable of developing an excavated subgrade relieved of any hydrostatic pressure that could cause a decrease in the stability of the excavated subgrade and which will provide the necessary groundwater control for the proper performance required for completion of the Work.

3.2.2.5.3 Dispose of subsurface water collected in a manner which conforms to all applicable local and state ordinances, statutes and laws. Obtain all permits required for operation of the dewatering system.

3.2.2.5.4 Maintain continual and complete effectiveness of the dewatering system operation to provide a firm, stable, excavated subgrade at all times as required for proper performance of the Work.

3.2.2.5.5 Provide dewatering necessary to maintain the groundwater table 18 in (450 mm) below the base of the proposed structure and/or pipe at all times.

3.2.2.5.6 Erosion Control: Provide adequate protection from erosion from any of the dewatering operations utilized during the course of the construction. Any damage, disruption or interference to newly constructed work or existing properties, buildings, structures, utilities and/or other work resulting directly or indirectly from dewatering operations conducted under this Contract shall be remedied by the CONTRACTOR, at no cost to the OWNER or NHDOT.

3.2.2.5.7 Treatment of Dewatering Operations Discharges: Provide such additional treatment devices as may be required to meet the provisions of the Contract. This may include the construction of sumps and/or settling basins, stone rip-rap, silt fences or other requirements. The treatment devices shall be later removed and/or filled in with acceptable backfill material, and restored to original conditions once they are no longer needed, at no additional cost to the OWNER or NHDOT.

3.2.3 Over-Excavation - If, in the opinion of the ENGINEER together with the OWNER, the material at or below the depth of the trench is unsuitable for foundation, it shall be removed to such depths as directed by the OWNER and shall be replaced with granular backfill (sand) and placed as provided in 209.3.

3.2.3.1 Where the bottom of the excavation shall, by error of the CONTRACTOR, have been taken to a depth greater than the depth shown on the drawings, or as directed,

said condition shall be corrected by refilling to the proper grade with compacted granular backfill (sand). All costs shall be borne by the CONTRACTOR.

3.2.4 Rock and Boulder Excavation - Rock and boulder excavation shall be in accordance with "Section 206, Structure Excavation for Pipes and Other Minor Structures."

3.2.5 Excess and Unsuitable Excavation - Excess excavation that will not be used for backfill, and unsuitable excavation shall be removed from the site and disposed of by the CONTRACTOR in accordance with local, state or federal regulations.

3.3 Trench Backfill.

3.3.1 General - After the pipe has been placed and has been inspected by the OWNER together with the ENGINEER, backfilling shall be performed without delay.

3.3.2 Bedding - Bedding shall be crushed stone and shall extend 6 in (150 mm) below the pipe invert, to the trench walls, to springline (horizontal centerline) of pipe. Placement and compaction of bedding to 95% Modified Proctor in accordance with ASTM D 157 and ASTM D 2922 shall be done prior to placement of the pipe and blanket.

3.3.3 Blanket - From the springline of the pipe to a minimum of 12 in (300 mm) above the pipe crown, the trench shall be backfilled by placing and compacting the sand in lifts of 6 in (150 mm) or less to 95% Modified Proctor in accordance with ASTM D 157 and ASTM D 2922. The filling shall be carried up evenly on both sides of the pipe, care being taken not to raise or otherwise dislodge the pipe. Backfill to this depth shall be thoroughly compacted with approved hand-operated devices.

3.3.4 Backfill - Backfill material from 12 in (300 mm) above the pipe crown to the underside of the pavement select material profile, or to the underside of gravel and loam areas, shall be backfilled with common backfill described herein and as approved by the ENGINEER.

3.3.4.1 Backfill shall be placed and compacted in layers of 6 in (150 mm) or less. Compaction shall be by hand-operated compactors.

3.3.4.2 Tamping of trenches with excavating machines is prohibited.

3.3.4.3 Trench areas improperly backfilled or having excessive settlement, as determined by the ENGINEER, shall be reopened to the required grade and repaved as necessary. The CONTRACTOR shall receive no additional compensation for repair of trenches constructed under this Contract.

3.3.4.4 Soil compaction for pipe backfill shall be 95% Modified Proctor in accordance with ASTM D 157 and ASTM D 2922.

3.3.5 Temporary Trench Pavement Patch - All pavement patching of sewer pipe-related trenches shall be in accordance with Section 403.115.

3.4 Sewer Installation.

3.4.1 General.

3.4.1.1 Pipe and fittings shall be handled with care to ensure that the pipe and fittings are in sound, undamaged condition. Particular care shall be taken to prevent damage to pipe coating and lining (if any).

3.4.1.2 The CONTRACTOR shall furnish slings, straps and/or other approved devices to support the pipe when it is lifted. Pipe and fittings shall not be dropped from trucks onto the ground or into the trench. Transporting pipe and fittings from storage areas shall be restricted to operations which will not cause damage to the pipe or lining (if any).

3.4.1.3 All pipe and fittings shall be examined before laying, and no pipe or fittings shall be installed which are found to be defective. Damaged pipe coatings and/or lining (if any) shall be repaired as approved or directed by the ENGINEER at no additional cost to the OWNER or NHDOT.

3.4.1.4 Any pipe showing a distinct crack with no evidence of incipient fracture beyond the limits of the visible crack, if approved, may have the cracked portion cut off by, and at the expense of, the CONTRACTOR before the pipe is laid so that the pipe used is sound. The cut shall be made in the sound portion of the barrel at least 12 in (300 mm) from the visible limit of the crack.

3.4.1.5 If any defective pipe is discovered after it has been laid, the CONTRACTOR shall remove the defective pipe and replace it with sound pipe at no additional cost to the OWNER or NHDOT.

3.4.1.6 In general, gravity pipe laying shall proceed upgrade with spigot ends pointing in the direction of the flow.

3.4.1.7 Flow from existing service connections and main lines shall be maintained at all times by pumping or other methods approved by the ENGINEER. Under no circumstances will the dumping of raw sewage on private property, in municipal streets or into waterways, be allowed.

3.4.2 Control of Alignment and Grade.

3.4.2.1 Easement and property and other control lines necessary for locating the Work, as well as elevations and bench marks used in the design of the Work, are shown on the Drawings. The CONTRACTOR shall use this information to set line and use a level or transit to set grade.

3.4.2.2 The CONTRACTOR shall use laser equipment to assist in setting the pipe and casing and must demonstrate satisfactory skill in its use.

3.4.2.3 The use of string levels, hand levels, carpenter's levels or other similar devices for transferring grade or setting pipe are not to be permitted.

3.4.2.4 During construction provide the OWNER, upon request, all reasonable and necessary materials, opportunities, and assistance for setting stakes and making measurements, including the furnishing of one or two rodmen as needed at intermittent times.

3.4.2.5 CONTRACTOR shall not proceed until he has made timely request of the ENGINEER for, and has received, such controls and instructions as may be necessary as Work progresses. The Work shall be done in strict conformity with such controls and instructions.

3.4.2.6 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes, and in case of willful, careless, or accidental destruction by his own workers, he will be responsible for the resulting expense to re-establish such destroyed control data and shall be responsible for any mistakes or delay that may be caused by the loss or disturbance of such control data.

3.4.2.7 Maintain good alignment in laying pipe. The deflection at joints shall not exceed the manufacturer's recommended limit. Provide fittings, if required, in addition to those shown on the Drawings when pipe crosses utilities encountered when excavating the trench. Use solid sleeves only where shown on the plans unless otherwise approved by ENGINEER.

3.4.3 Installing Pipe and Fittings.

3.4.3.1 The CONTRACTOR shall have on the job site with each pipe laying crew, all the proper tools to handle and cut the pipe.

3.4.3.2 All pipe and fittings shall be thoroughly cleaned before laying, and shall be kept clean until installed.

3.4.3.3 Pipe shall be laid in the dry trench conditions. At no time shall water in the trench be permitted to flow into the pipe. At any time that Work is not in progress, or the trench is unattended, the end of the pipe in the trench shall be suitably closed to prevent the entry of animals, earth, water, etc. using watertight expandable plugs.

3.4.3.4 Lay PVC pipe and fittings in accordance with the requirements of AWWA C 900, except as provided herein. PVC pipe shall not be installed when temperatures are below 32 ° F (0 ° C) unless approved by the ENGINEER.

3.4.3.5 Lay ductile iron pipe and fittings in accordance with the requirements of AWWA C 600, except as provided herein.

3.4.3.6 Excavation shall conform to the Trenching Section shown on the plans.

3.4.3.7 As soon as excavation has been completed to the proper depth the pipe bed shall be prepared as follows:

3.4.3.7.1 Pipe Laid on Bedding Material: Place and compact bedding materials, as specified in the Trenching Section, to the elevation necessary to bring the pipe to grade. The compacted material shall be shaped so that the bottom quadrant of the pipe rests firmly on the bedding for the entire length of pipe barrels. Suitable holes shall be dug for bells or couplings to provide ample space for jointing pipe.

3.4.3.8 Each pipe section shall be placed into position on the pipe bed in such a manner and by such means required to avoid injury to persons, any property or the pipe.

3.4.3.9 Permanent blocking under the pipe is not permitted except where a concrete cradle is required, in which case precast concrete blocks shall be used.

3.4.3.10 Jointing shall conform to the manufacturer's instructions and appropriate ASTM Standards.

3.4.3.11 Any debris, tools etc. shall be removed from the pipe.

3.4.3.12 After placing the pipe on the bedding, the bedding material shall be placed and compacted to the spring line (horizontal centerline) of the pipe.

3.4.3.13 Following placement of the bedding material, the blanket material shall be placed and compacted from the spring line to 12 in (300 mm) above the crown of the pipe.

3.4.3.14 After placement of the blanket material the pipe shall be checked for alignment and grade. If the pipe has been properly installed, the CONTRACTOR may refill or backfill the remainder of the trench in conformance with the Trenching Section, and details shown on the Drawings.

3.4.3.15 At the end of each day's work, or more frequently, the ENGINEER will view the pipe installation with the CONTRACTOR. Unsatisfactory work shall be dug up and reinstalled to meet the requirements of the Contract Documents with no additional time allowed for completion of the Work and at no additional cost to the OWNER or NHDOT.

3.4.3.16 When cutting of pipe is required, the cutting shall be done by machine (power cutter) without damage to the pipe or cement lining (if any). Cut ends shall be smooth and at right angles to the long axis of the pipe. Pipe ends to be used with a rubber gasket joint shall be beveled and filed or ground smoothly to conform to a manufactured spigot.

3.4.4 Service Connections.

3.4.4.1 House service lines shall be laid from the wye connection on the main line sewer to the property line, as directed by the ENGINEER.

3.4.4.2 All new service connections shall be 6 in (150 mm) PVC.

3.4.4.3 New services shall terminate as shown on the Drawings, be capped with a watertight cap, and the end shall be marked with a ferrous metal rod or pipe terminating at finish grade.

3.4.5 Testing.

3.4.5.1 General.

3.4.5.1.1 Leakage tests under the direction of the ENGINEER shall be conducted on all pipes installed under this section of the Work. Deflection tests shall be conducted on PVC pipe as ordered by the ENGINEER. The ENGINEER shall witness all tests. The CONTRACTOR shall supply all plugs, pumps, weirs, gauges, water, water trucks, mandrels, etc., necessary to conduct the tests. Should the Work fail the leakage or deflection tests, corrective action shall be taken by the CONTRACTOR in a manner approved by the ENGINEER and, if directed by the ENGINEER, the CONTRACTOR shall dig up and relay the failed section with no additional time allowed for completion of the Work and at no additional cost to the OWNER or NHDOT.

3.4.5.1.2 The use of sealants, applied from the inside of the pipe, is not acceptable.

3.4.5.1.3 Flush all piping systems with water prior to testing.

3.4.5.1.4 Testing forms which indicate all testing information and results shall be submitted to the ENGINEER.

3.4.5.2 Sanitary Sewer Pipe Testing With All Service Connections Capped.

3.4.5.2.1 Air Test: Leakage testing shall be by means of low-pressure air in accordance with the procedures described in UNI-B-6. The maximum allowable pressure drop from the test pressure shall be 1.0 psig (6.89 kPa) during the minimum holding time.

Test pressure psi (kPa) shall be calculated using the following equation:

(ENGLISH)

(METRIC)

$P = 3.5 + (H/2.31)$	$P = 24.1 + (H/0.102)$
P = Test pressure (max. =9 psi)	P = Test pressure (max. = 62.0 kPa)
H = Height (ft) of groundwater above invert.	H = Height (m) of groundwater above invert.

Minimum holding time required for a 1.0 psig (6.89 kPa) maximum pressure drop shall be calculated using the following chart.

(ENGLISH)

Length Min. Pipe Dia. (in.)	Time For Time (min: sec)	For Min. Time (ft)	Time (min:sec) for Length (L) Shown Longer Length (sec)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	
	4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46
	6	5:40	398	.854 L	5:40	5:40	5:40	5:40	5:40	5:40
	8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52		
13:51										
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05		
19:56										
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42		
31:09										
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27		
44:52										
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21		
61:00										
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22		
79:46										
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32		
	100:57									
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50		
	124:38									
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16		
	150:43									
	36	34:00	66	30.768 L	51:17	76:55	102:34	128:12		
	153.50	179.29								

(METRIC)

Length Min. Pipe Dia. (mm.) m	Time For Time (min: sec)	For Min. Time (m)	Time (min:sec) for Length (L) Shown Longer Length (sec)						
				30 m	45 m	60 m	75 m	90 m	105

	100	3:46	182	1.24 L	3:46	3:46	3:46	3:46	3:46	3:46
	150	5:40	121	2.80 L	5:40	5:40	5:40	5:40	5:40	5:40
200	7:34	91	4.99 L	7:34	7:34	7:34	7:34	7:36	8:52	
250	9:26	73	7.789 L	9:26	9:26	9:26	9:53	11:52		
13:51										
300	11:20	61	11.21 L	11:20	11:20	11:24	14:15	17:05		
19:56										
375	14:10	48	17.526 L	14:10	14:10	17:48	22:15	26:42		
31:09										
450	17:00	41	25.236 L	17:00	19:13	25:38	32:03	38:27		
44:52										
525	19:50	35	34.350 L	19:50	26:10	34:54	43:37	52:21		
61:00										
600	22:40	30	44.862 L	22:47	34:11	45:34	56:58	68:22		
79:46										
675	25:30	27	56.778 L	28:51	43:16	57:41	72:07	86:32		
	100:57									
750	28:20	24	70.098 L	35:37	53:25	71:13	89:02	106:50		
	124:38									
825	31:10	22	84.816 L	43:05	64:38	86:10	107:43	129:16		
	150:43									
	900	34:00	20	100.945L	51.17	76.55	102.34	128.12		
	153.50	179.29								

3.4.5.3 Deflection Test for Flexible Pipe: Optional devices for testing include calibrated television, photography, properly sized "GO-NO-GO" mandrel, sewer ball or deflectometer. Maximum allowable pipe deflection shall be five percent (5%). The deflection test shall be performed no sooner than thirty (30) days after installation.

3.4.5.4 Force Main Testing: Force mains shall be tested for pressure and leakage in accordance with AWWA C 600, except as amended or added below:

3.4.5.4.1 Water to be furnished by CONTRACTOR.

3.4.5.4.2 Test Duration: Two (2) hours.

3.4.5.4.3 Test Pressure: One hundred and fifty percent (150%) of maximum operating pressure, or 100 psi (690 kPa), or the greater of the two, as determined by the ENGINEER.

3.4.5.4.4 Allowable Pressure Loss: Pressure shall not vary more than ± 5 psi (34 kPa) for the duration of the pressure test.

3.4.5.4.5 Allowable Leakage: Allowable leakage shall be determined by the following formula:

ENGLISH	METRIC
$L = \underline{SD(P)^{0.5}}$	$L = \underline{SD(P)^{0.5}}$

(METRIC)

Nominal Pipe Diameter-mm.

Avg. Test Pressure kPa	75	100	150	200	250	300	350	400	450	500
600										
3100	0.60 4.74	0.79	1.18	1.58	1.97	2.37	2.77	3.17	3.56	3.95
2750	0.56 4.47	0.75	1.12	1.49	1.86	2.24	2.61	2.98	3.35	3.73
3400	0.52 4.19	0.70	1.04	1.39	1.74	2.10	2.45	2.79	3.14	3.49
2050	0.48 3.87	0.65	0.97	1.29	1.61	1.94	2.26	2.58	2.91	3.23
1900	0.46 3.71	0.62	0.93	1.24	1.53	1.85	2.16	2.47	2.78	3.09
1700	0.45 3.54	0.58	0.88	1.18	1.48	1.76	2.06	2.36	2.66	2.94
1550	0.42 3.35	0.56	0.84	1.12	1.40	1.68	1.96	2.24	2.52	2.79
1400	0.40 3.17	0.53	0.79	1.06	1.32	1.59	1.83	2.11	2.37	2.63
1200	0.37 2.96	0.50	0.73	0.99	1.23	1.48	1.73	1.97	2.22	2.46
1050	0.35 2.75	0.46	0.68	0.92	1.14	1.37	1.60	1.83	2.06	2.28
850	0.31 2.50	0.42	0.62	0.83	1.04	1.25	1.47	1.66	1.88	2.09
700	0.29 2.24	0.37	0.56	0.74	0.93	1.18	1.30	1.49	1.68	1.86

3.4.6 Protection of Water Supplies.

3.4.6.1 There shall be no physical connection between a public or private potable water supply system and a sewer, or sewer appurtenance, which would permit the passage of any sewage or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole.

3.4.6.2 Sewers shall be located outside a 400 feet (125 m) radius centered at a municipal well; 200 feet (60 m) radius centered at a small public well, and 75 feet (25 m) radius centered at a private well.

3.4.6.3 Sewers shall be located during design, at least 10 feet (3 m) horizontally from any existing or proposed water main, except that a deviation from this separation to avoid subsurface structures, including telecommunication chambers, interference of building foundations shall be allowed, provided that the sewer is constructed as follows:

3.4.6.3.1 Sewer pipe shall be class 52 ductile iron for a maximum distance of 75 feet (25 m) each side of the obstruction.

3.4.6.3.2 Joints shall be mechanical type water pressure rated with zero leakage when tested at 25 psi (172 kPa) for gravity sewers and 1-1/2 times working pressure for force mains.

3.4.6.4 Whenever sewers must cross water mains, the sewer shall be constructed as follows:

3.4.6.4.1 Sewer pipe shall be class 52 ductile iron for a minimum distance of 9 feet (2.75 m) each side of the crossing.

3.4.6.4.2 Joints shall be mechanical type water pressure rated with zero leakage when tested at 25 psi (172 kPa) for gravity sewers and 1-1/2 times working pressure for force mains and joints shall not be located within 9 feet (2.75 m) of the crossing.

3.4.6.4.3 Vertical separation of the sewer and water main shall not be less than 18" (450 mm)

3.5 Manhole Installation.

3.5.1 Installation of Manhole Bases and Sections.

3.5.1.1 Precast bases shall be placed on a 1'-0" (0.3 m) layer of compacted bedding material. The excavation shall be properly dewatered to allow placing of bedding material and setting the manhole base on completely drained subgrade.

3.5.1.2 Inlet and outlet stubs shall be connected and sealed in accordance with the manufacturer's recommended procedure, and as shown on the Drawings.

3.5.1.3 Barrel sections and cones of the appropriate combination of heights shall then be placed, using manufacturer's recommended procedure for sealing the horizontal joints.

3.5.1.4 A leakage test shall then be made as described below in this section.

3.5.1.5 Upon successful completion of the leakage test all joints shall be pointed.

3.5.1.6 The exterior waterproofing coat shall be touched up after installation and shall be applied to the exterior of all joints in accordance with manufacturer's recommendations.

3.5.1.7 The inverts and the shelf shall be constructed of brick.

3.5.1.8 The frame and cover shall be placed on the top of the manhole or some other approved means shall be provided to prevent accidental entry by unauthorized persons, children, animals, etc., until the CONTRACTOR is ready to make final adjustment to grade.

3.5.2 Mixing Mortar.

3.5.2.1 Mortar shall be mixed in accordance with ASTM C 270 or the recommendations of the manufacturer.

3.5.3 Brick Masonry.

3.5.3.1 Only clean bricks shall be used in brickwork for grade adjustment and manhole inverts. The bricks shall be moistened by suitable means, until they are in a surface dry, saturated condition.

3.5.3.2 Each brick shall be laid in full bed and joint of mortar without requiring subsequent grouting, flushing, or filling, and shall be thoroughly bonded.

3.5.3.3 Brick masonry shall be protected from too rapid drying. Use an approved cover and protect from the weather and frost.

3.5.3.4 All masonry joints which are exposed to view shall be examined to locate cracks, pointed up and filled with mortar. Where necessary, in the opinion of the ENGINEER, the joints shall be cut out and repointed with mortar.

3.5.3.5 All brick masonry inverts shall allow unimpeded flow. Steps or puddles will be basis for rejection.

3.5.4 Setting Frames and Covers.

3.5.4.1 Frames shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the Drawings. Frames shall be set concentric with the top of the masonry and in a full bed of mortar so that the space between the top of the manhole masonry and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around and on the top of the bottom flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.

3.5.4.2 Manhole covers shall be left in place in the frames on completion of other work at the manholes.

3.5.5 Leakage Tests for Sewer Manholes.

3.5.5.1 Leakage tests shall be made and observed by the ENGINEER on each manhole. The test shall be a vacuum test made as described below.

3.5.5.2 Vacuum test:

3.5.5.2.1 The vacuum test may be performed on manholes, completely constructed, with inlet and outlet pipes in place. Test shall be conducted before any backfilling begins. Any material around the base section shall be removed to expose the entire side of the manhole. Plug pinholes and horizontal seams with a non-shrinking mortar.

3.5.5.2.2 Brace the inlet and outlet pipes/plugs to prevent movement during the test. Use air inflated plugs in good condition.

3.5.5.2.3 The vacuum test shall be performed using equipment approved by the ENGINEER. The equipment shall be in good operating condition. No gauges are to have any broken glass or other visible abnormalities. The test shall be performed by trained personnel familiar with the equipment and the test.

3.5.5.2.4 The test shall have a minimum duration of two minutes. The vacuum shall be pumped down to 10 inches (250 mm) of mercury on an approved gauge, and held. At the time the removal of air is stopped, the test time shall begin.

3.5.5.2.5 Any manhole that has a vacuum drop to nine inches (225 mm) of mercury or less, within the following time intervals, shall have failed the test.

0 – 10 ft. (3.0 m) deep: less than 2 minutes.
10 ft. (3.0 m) – 15 ft. (4.5 m) deep: less than 2-1/2 minutes.
15 ft. (4.5 m) – 20 ft. (6.0 m) deep: less than 3 minutes.
over 20 ft. (6.0 m) deep: less than T.
Calculations for manholes deeper than 20 feet (6.0 m).

$$T = 0.085 DK/Q$$

T = Time of pressure drop in seconds

K = 0.000419 DL; but not less than 1.0

Q = 0.0015 ft³/min/ft² of area

D = Nominal manhole diameter in .

L = Depth of manhole in feet .

$$T = 2.159 DK/Q$$

T = Time of pressure drop in seconds

K = 0.003244 DL; but not less than

Q = 0.00046 m³/min/m² of area

D = Nominal manhole diameter in mm

L = Depth of manhole in meters

3.6 ByPass Pumping

3.6.1 The CONTRACTOR shall submit a plan for bypass pumping (Bypass Plan) of sewage around the work area and facilities where sewage flows must be interrupted to carry on the work. The Bypass Plan shall include the following

3.6.1.1 A sketch of the bypass pumping layout showing the proposed suction and discharge locations, the position of all pumps, piping, generators, etc., and the proposed piping route;

3.6.1.2 Specifications for all pumping equipment to be used on the project (including all sizing calculations, pump curves, etc.). The bypass equipment shall be adequate to handle the expected peak flows with a minimum 2X margin of safety;

3.6.1.3 A list of all backup pumping equipment to be held in reserve on the project site;

3.6.1.4 A description of any specialized equipment which may be needed such as bridge piping for driveway access, and temporary stream crossing support of temporary bypass piping;

3.6.1.5 A list of all On-Call personnel who will be able to respond should a problem develop. The CONTRACTOR shall provide qualified service personnel who can reach the site within 30 minutes after a high-water or other alarm is activated.

3.6.2 Electric primary pumping is acceptable and preferred, with 100% redundancy provided in the form of diesel or other auxiliary backup equipment.

3.6.3 An auto-dialer, or other automatic notification equipment shall be provided to notify the CONTRACTOR of any problems with the equipment.

3.6.4 The CONTRACTOR is responsible for all electrical costs for bypass pumping, including the installation of temporary power poles, metering, etc.

3.6.5 The Bypass Plan shall be reviewed and approved by the OWNER and the ENGINEER before any work is started. Such approval does not guarantee the adequacy of the bypass pumping system. Should the proposed bypass system have inadequate capacity to properly transport wastewater around the work area, the CONTRACTOR shall take whatever measures are needed to supplement the equipment including larger and / or more numerous pumps and piping.

3.6.6 The CONTRACTOR is responsible for insuring that the operation of any mechanical bypass equipment does not violate local noise ordinances. The CONTRACTOR shall incorporate whatever noise abatement measures which are needed, including the use of "Quiet Pack" pumps, insulated enclosures, supplemental mufflers on diesel engines, etc..

3.6.7 If, at any time during construction, effluent from the existing sewer is not fully contained by the bypass pumping system, gravity service shall be restored, and the WORK suspended until the problem is resolved to the satisfaction of the OWNER. This includes wastewater flow into trenches during excavation work. Sewer system overflows will not be tolerated. The CONTRACTOR shall be liable for any fines or cleanup costs associated with failures of the bypass pumping system, regardless of the cause or responsible party.

Method Of Measurement

- 4.1 Sanitary gravity sewer and sewer services of the kind, type and size specified will be measured by the linear foot (linear meter) to the nearest 0.1 foot (meter) to the inside face of manholes.
- 4.2 Sewer service wyes will be measured as each wye furnished and installed.
- 4.3 Sewer manholes will be measured by the vertical foot (meter) to the nearest 0.1 foot (meter) from invert to bottom of frame and cover.
- 4.5 Gravity sewer bridge crossing, including steel girders, pipe of the kind, type and size specified, fittings, fabrications, supports, hangers, and insulation shall be measured by the unit from the back wall of abutment A to the back wall of abutment B.
- 4.6 Temporary Bypass Pumping including Bypass Plan; provision, installation and removal of bypass pumping system; electrical connections shall be measured by the dollar.
- 4.7 No separate measurement will be made for plugging of abandoned sewers.
- 4.6 The ENGINEER must be involved in and approve the measurement of any pay item.

Basis Of Payment

- 5.1 The accepted quantity of sanitary gravity sewer, sanitary force main sewer, and service pipe will be paid for at the contract price per linear foot (linear meter) complete in place as shown on the plans and specified herein, and shall include furnishing and installing pipe, excavation, bedding, blanket, backfill, couplings, bends, testing, sheeting, shoring, dewatering, restoration, connection to existing sewers, and all other work required for or incidental to the completion of this item except as noted below.
 - 5.1.1 Common structure excavation required for the removal of unsuitable material below the typical trench section will be paid for as provided under 206.
 - 5.1.2 Rock structure excavation and common structure excavation exploratory will be paid for as provided under 206.
 - 5.1.3 Granular backfill (sand) to replace material excavated under 5.1.1 will be paid for as provided under 209.
- 5.2 The accepted quantity of sewer pump stations will be paid at the contract unit price complete in place and shall include furnishing and installing all components necessary for the proper function of the pump stations as noted in the plans and specifications. Asphalt pad (403.12), Concrete Generator Pad (520.1), Crushed Gravel

(304.2), and Fencing (607.36, 607.436, 607.73612) shall be paid in accordance with specification numbers provided.

5.3 The accepted quantity of sewer service wyes will be paid at the contract unit price and shall include furnishing and installing the wyes and all other work required or incidental to the completion of this item.

5.4 The accepted quantity of sewer manholes will be paid for at the contract unit price per vertical foot (meter) and shall include furnishing and installing manhole base, riser and cone sections, frames and covers, installing inside drop connections where required, furnishing and installing pipe stubs and couplings for "cut-in" manholes where required, brick channel and table, all brick work to adjust frames, testing, and all other work required or incidental to the completion of this item.

5.5 The accepted quantity of gravity sewer bridge crossing including pipe shall be paid for at the contract price per unit complete in place as shown on the Drawings and specified herein, and shall include furnishing and installing steel girders, pipe, insulation, insulation protection shield, rollers and fittings, expansion joints, and all other work required for or incidental to the completion of this item.

5.6 Temporary Bypass Pumping shall be paid for on a dollar basis according to 109.04 Method B, C or D.

5.6.1 Payment under this item will be include preparation of Bypass Plan; installation, maintenance and removal of pumping equipment, piping, stream crossing support, backup equipment, notification equipment; temporary modifications to existing sanitary sewer systems to allow for bypass pumping; and provision of temporary electrical and communication service, monthly electrical and communication service.

5.6.2 No payment will be made for clean-up, fines, or other measures required due to the CONTRACTOR'S failure to monitor and maintain the pumping system.

5.6.3 The dollar amount inserted into the Proposal under this item is the amount the OWNER has set for Bypass Pumping. This amount must not be altered by the Bidder on the Proposal and must be included in the Grand Total of the bid.

5.6.3.1 Payment of this amount set in the Proposal will not be a lump sum. Only the dollar value as authorized will be paid.

5.7 Any work not specifically having a pay item and necessary for a complete and operational sanitary sewer, as herein specified and called for on the plans, shall be considered incidental and subsidiary to the pay item work specified herein. The work considered as subsidiary and not separately paid for shall include but not be limited to the following:

5.7.1 Pipe material handling and storage on site.

- 5.7.2 Excavation, bedding, blanket and backfill.
- 5.7.3 Sheeting, shoring, and dewatering of trenches (if applicable).
- 5.7.4 Restoration of property, utilities, and water lines (if applicable).
- 5.7.5 Pressure testing and lamping.
- 5.7.6 Plugging abandoned sewers.
- 5.7.7 Bituminous pavement for the temporary trench patch, including wheel cutting of existing pavement.
- 5.7.8 Record drawings.
- 5.7.9 Connections to existing sewers and couplings.

Pay items and units (ENGLISH):

612.10	Sewer Pump Station Package – Complete, including Emergency Generator	U	
612.3103	3" P.V.C. Sewer Pipe, SDR 26, Force Main	LF	
612.3106	6" P.V.C. Sewer Pipe House Service, SDR 35	LF	
612.3108	8" P.V.C. Sewer Pipe, SDR 35	LF	
612.7104	Sewer Manhole, 4' Diameter	VF	
612.7105	Sewer Manhole, 5' Diameter		VF

SUPPLEMENTAL SPECIFICATION

SECTION 645 – EROSION CONTROL

Amend to 2.1 to read:

Hay mulch will not be allowed. Straw mulch may be substituted where hay is specified in the section.

Amend 2.5 to read:

Hay bales will not be allowed. Bales must be straw.

SUPPLEMENTAL SPECIFICATION

SECTION 670 – MAILBOXES

Description

- 1.1 This item shall consist of temporarily relocating and permanently locating mailboxes and support assemblies as necessary to provide project residents with uninterrupted mail service.

Materials

- 2.1 When replacement of mailbox support assemblies is required, the replacement shall be of the same material and substantially the same design (dimensions) as the existing post.

Construction Requirements

- 3.1 The Contractor shall temporarily relocate mailbox assemblies or furnish temporary assemblies to assure uninterrupted mail service.
- 3.2 At the completion of construction, the contractor shall permanently install all mailbox assemblies at a location agreeable to the homeowner and according to specifications of the U.S. Postal Service.
- 3.3 Where the mailbox support assembly is in poor condition at the beginning of construction, the contractor shall furnish and install a similar assembly.

Method of Measurement

- 4.1 Relocating and installing mailboxes and support assemblies will not be measured for payment. The work shall be considered subsidiary to the contract items.
- 4.2 When a support assembly is in condition that will not allow for satisfactory relocation or is damaged through no fault of the contractor, a replacement assembly will be measured for payment.

Basis of Payment

- 5.1 No separate payment will be made for relocating and installing mailbox support assemblies.
- 5.2 Mailbox support assemblies replaced as agreed by the Town shall be reimbursed at actual material cost plus a fifteen percent markup.
- 5.3 No payment will be made to replace mailboxes and support assemblies damaged by the contractor or his operations.

SUPPLEMENTAL SPECIFICATION

SECTION 1002 – ADJUSTING WATER MAINS AND SEWER SERVICES

Description

- 1.1 This item consists of relocating existing water mains and appurtenances or sewer services when physical conflicts can not be resolved by redesign of the proposed storm drain.

Materials

- 2.1 All material for water main relocation shall be as specified by the Merrimack Village District.
- 2.2 All material for sewer service reconstruction shall be as specified by the Merrimack Village District.

Construction Requirements

- 3.1 All water main relocation shall be performed as specified by the Merrimack Village District.
- 3.2 All sewer service relocation shall be performed as specified by the Merrimack Village District.

Method of Measurement

- 4.1 Utilities damaged by the contractor or not in conflict with the proposed storm drain will not be measured for payment.
- 4.2 Utility relocation agreed to by the Town will be measured as extra work as defined in the Standard Specifications.

Basis of Payment

- 5.1 Utility relocation or reconstruction due to damage caused by the Contractor's operation will not be reimbursed.
- 5.2 Payment for utility relocation or reconstruction agreed to by the Town will be reimbursed on the basis of labor, equipment and materials cost as described in the extra work section of the Standard Specifications.

02/17/11

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SSD: 12/3/79, 4/10/80, 11/19/82, 5/9/83, 12/7/90, 12/20/96, 07/14/04, 09/01/05, 08/06/07, 01/07/09, 04/15/09 & 11/30/09, 05/12/10

January 16, 2015

SPECIAL ATTENTION

FUEL ADJUSTMENT

(a) The shortage of all products in relation to the national and worldwide energy situation has made future costs of fuel unpredictable. For this reason, a price adjustment clause is being inserted in this contract to provide for either additional compensation to the Contractor or payment to the State, depending upon an increase or decrease in the price of fuel.

(b) The fuel usage factors, which will be applied to the several items of the Contract shall be those set forth in Table 1.

(c) Price adjustment will be based upon the quantity of fuel incorporated in the work as determined by the factors in Table 1.

When the monthly sales price determined per paragraph (f) is more than 110% of the fixed base price set forth in paragraph (e), a contract adjustment will be made under Item 1010.15 based on: [monthly sales price less 110% of the fixed base price] multiplied by [item quantity eligible for payment during month] multiplied by [fuel factor].

When the monthly sales price determined per paragraph (f) is less than 90% of the fixed base price set forth in paragraph (e), a contract adjustment will be made under Item 1010.15 based on: [monthly sales price less 90% of the fixed base price] multiplied by [item quantity eligible for payment during month] multiplied by [fuel factor].

(d) The Contractor warrants that its bid prices for this Contract include no allowances for any contingency to cover increased costs for which adjustment is provided herein.

(e) The fixed base price of fuel will be:

\$ 2.1991 per gallon on English Projects.

\$ 0.5810 per liter on Metric Projects.

This price is used solely to compute price adjustments. The fuel price will be the lower bulk retail price of **ultra low sulfur diesel fuel** for Boston as published by the Journal of Commerce and will include current Federal and State taxes.

(f) The monthly sales price of fuel will be determined by the Department on the 15th calendar day of each month. When the 15th calendar day falls on a Sunday, the price on the first business day following the 15th calendar day will be utilized. Monthly sales prices will be set in the same manner as indicated in paragraph (e).

(g) The price adjustment, when such adjustment is called for as provided in paragraph (c), will be made subsequent to the month in which the work was accomplished.

(h) No price adjustment will be allowed beyond the Project completion date unless there is a Department-approved extension of time. Price adjustments will be made on quantities adjusted as a result of the final audit.

(i) The Department will not be responsible for computing or otherwise indicating price adjustments except to the prime contractor, which must make its own arrangements with its subcontractors.

(j) When no item for Fuel Adjustment is included in the Contract no adjustments will be made.

Pay item and unit:

1010.15	Fuel Adjustment ¹	\$
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¹ Not a bid item.

Table 1 - FUEL FACTORS

Item of Work	Item No.	Units	Fuel	
Excavation:				
Earth	203.1_.,4_	gal/c.y.	0.26	
	203.50_.,51_.,52_	(liters/m ³)	(1.29)	
	203.6_.,7_			
	206.1_			
	207.1_			
	504.1_			
Rock	203.2_	gal/c.y.	0.34	
	206.2_	(liters/m ³)	(1.68)	
	207.2_			
	504.2_			
Other	203.3_	gal/c.y.	0.31	
	206.3_	(liters/m ³)	(1.54)	
	207.3_			
	583._			
	585._			
	586._			
	587._			
Bases:				
Unprocessed	209._	gal/c.y.	0.46	
	304.1_.,2_	(liters/m ³)	(2.28)	
Processed	304.3_	gal/c.y.	0.82	
	304.4_.,5_.,6_	(liters/m ³)	(4.06)	
	508._			
Bituminous Concrete				
Pavement ²	403._	gal/ton	1.90	
	411._	(liters/t)	(7.93)	
All Other Items:		gal/\$1,000 of work (liters/\$1,000 of work)	13.0 (49.2)	
Excluded Items: ³				
210._	510.61_	560._	565.2_	645.7_
211._	510.65_	561._	568._	692._
306.31_	528._	563.1_	592._	698._
306.32_	544._	563.2_	603.0001	8_._.
410._	548._	563.3_	618._	10_._.
510.31_	550.1_	563.7_	619._	
510.41_	550.2_	565.7_	624._	

² Item 403.4 & 403.6 shall be calculated using the "All Other Items" category rate.³ Also excluded are all supplementary agreements, extra work and per specification items.

03/31/14

SSD: 7/30/75, 5/9/83, 12/5/84, 2/12/92, 10/19/93, 5/9/94, 1/26/95,
12/30/96, 02/24/97, 12/08/08, 4/15/09, 01/01/12, 04/16/12

Page 1 of 2

January 15, 2015

SPECIAL ATTENTION**ASPHALT CEMENT ADJUSTMENT AND
ASPHALT CEMENT ADJUSTMENT FOR EMULSION**

Bid items involving asphalt concrete mixtures containing asphalt cement may be subject to a price adjustment. Only the asphalt portion of asphalt-rubber cement will be eligible for price adjustment. The adjustment will take effect when the monthly price for asphalt cement as furnished by the Bureau of Materials and Research differs from the base price contained in the proposal. Affected Sections and formulas are detailed below.

The **base price*** of asphalt cement for this Contract is:

\$ **585.00** per ton on English Projects.

\$ **644.85** per metric ton on Metric Projects.

* Source: The base price is developed from data published in the *Asphalt Weekly Monitor*, a publication from Poten and Partners, Inc. (Applies to contracts advertised after January 1, 2012)

The **monthly price** of asphalt cement will be furnished by the Bureau of Materials and Research on the first business day following the 14th calendar day of each month.

The contract prices of bituminous materials will be paid under the respective items in the contract. The price adjustment, as provided herein, upwards or downwards, will be made at the end of each month in which the work was accomplished as follows:

Item 403.__ - Pavement (except items 403.4 & 403.6) and Item 411.__ - Hot Bituminous Concrete Leveling Course and Plant Mix Surface Treatment

The price adjustment will be based on the percent of virgin asphalt cement stated in the Approved Mix Design containing the maximum percentage of reclaimed asphalt pavement. In the event of breakdown or unforeseen circumstances other than weather, an Approved Virgin Mix Design may be used. The price adjustment will then be based on the total percent of virgin asphalt cement in that approved design.

A contract adjustment will be made under Item 1010.2 based on; [monthly price minus the base price] X [Approved Mix Design percent of virgin asphalt cement] X [tons of pavement used].

03/31/14

SSD: 7/30/75, 5/9/83, 12/5/84, 2/12/92, 10/19/93, 5/9/94, 1/26/95,
12/30/96, 02/24/97, 12/08/08, 4/15/09, 01/01/12, 04/16/12

Page 2 of 2

Item 410.72 - Chip Seal Surface Treatment Rubber Polymerized

A contract adjustment will be made under Item 1010.2 based on; [monthly price minus the base price] X [asphalt factor] X [tons of AC used] where:

Assumptions:

- Asphalt factor equals 82%
- Tons of AC used equals the total number of gallons sprayed divided by 235

Item 419. __ - Bonded Wearing Course

A contract adjustment will be made under Item 1010.2 based on; [monthly price minus the base price] X [Total AC in the BWC process percent] X [tons of BWC paved] where:

Assumptions:

- Total AC in the BWC process equals 6% (includes the emulsion tack coat)
- Tons of BWC equals 0.04 times the number of SYs paved (80 lbs/SY)

Emulsified Asphalt Cement [Including Items 405. __, 410. __ (excluding 410.72), 418.11 __ and 418.32]

A contract adjustment will be made under Item 1010.21 based on; [monthly price minus the base price] X [percent of residual asphalt cement] X [Tons of Emulsion used].

Assumptions:

- Quantities are assumed to be measured at 60° F
- Volume reduction between typical delivery temperature (+/- 140° F) and 60° F is 2%
- Adjustment payment assumes 62% Residual Asphalt for all grades
- 239 Gallons/Ton is the unit conversion at 60° F

Item 1010.2	Asphalt Cement Adjustment ¹	Dollar
Item 1010.21	Asphalt Cement Adjustment for Emulsion ¹	Dollar

When no item for Asphalt Cement Adjustment and/or Asphalt Cement Adjustment for Emulsion is included in the contract no adjustments will be made.

¹ Not a bid item

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

MODIFIED STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

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Endorsed by



CONSTRUCTION SPECIFICATIONS INSTITUTE

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.
 12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
 13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined. The term Plans, wherever used herein, shall have the same meaning as Drawings.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The Engineer shall be Merrimack Department of Public Works (Director or his designee) unless otherwise stated in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction. Without limiting the foregoing, "Laws and Regulations" and "Laws or Regulations" include all permits, authorizations, consents or approvals pertaining to the Project or Work.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil,

petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.

47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

- A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
 1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.
- C. *Day:*
 1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
 1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

- c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor up to three (3) printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction. In addition to the Contract Documents furnished to Contractor by the Owner for Contractor's use during performance of the Work there shall be at least three (3) original executed copies of the Contract Documents to be distributed by the Owner as follows:
 1. One (1) copy each to the Owner, Engineer and Contractor.

2.03 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

2.08 *Non-Resident Contractor*

- A. The successful bidder, if a corporation established under laws other than the State in which the proposed Work is located, shall file, at the time of the execution of the contract, with the owner, notice of the time of the execution of

the contract and notice of the name of its resident attorney, appointed as required by laws of the State in which the proposed Work is located and not a corporation, shall file, at the time of execution of the contract, with the Owner, a written appointment of a resident of the State in which the Work is located, having an office or place of business therein, to be his true and lawful attorney upon whom all lawful processes in any actions or proceedings against him may be served, and in such writing, which shall set forth said attorney's place of residence, shall agree that any same legal force and validity as if served on him and that the authority shall continue in force so long as any liability remains outstanding against him in said State. The power of attorney shall be filed in the office of the Secretary of State if required, and copies certified by the Secretary shall be sufficient evidence thereof. Such appointment shall continue in force until revoked by an instrument in writing, designating in a like manner some other person upon whom such processes may be served, which instrument shall be filed in the manner provided herein for the original appointment.

B. A Non-Resident contractor shall be deemed to be:

1. A person who is not a resident in the State where the proposed construction is to be located.
2. Any partnership that has no member thereof resident in the State where the proposed Work is to be located.
3. Any corporation established under laws other than those of the State in which the proposed construction is located.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Any provisions in any of the Contract Documents which may be in conflict shall be subject to the following order of precedence for interpretation:
1. Technical Specifications will govern plans.
 2. Technical Specifications and Plans will govern Supplementary Conditions and Modified General Conditions.
 3. Supplementary Conditions shall govern Modified General Conditions.
 4. Special Conditions will govern Technical Specifications, Plans, Supplementary Conditions, and Modified General Conditions.
 5. The Agreement supersedes all other Contract Documents.
- D. The Agreement and the Contract Documents shall be governed by the laws of the State of New Hampshire.
- E. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;
2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer’s Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner’s obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer’s findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

- A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any

materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents.

These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. Notwithstanding anything in the foregoing to the contrary, Bonds may be in such other form as the Owner approves in writing. The Bonds shall name Owner as obligee as its interest may appear. The Bonds shall be issued by a surety licensed to do business in the State of New Hampshire. Notwithstanding anything in the Modified General Conditions to the Contrary, the surety shall be reputable and rated A or better and included in any of classes X through XV by Bests' Insurance Guide. Contractor shall provide for and acquire any amendment to such Bonds or an additional Bond to cover any increase in the Contract Price under the Contract Documents. The Bonds shall be executed on the Standard Forms provided in the Contract Documents. The surety shall be a company licensed to do business in the State of New Hampshire, and acceptable to the Owner and the Engineer. The Bonds shall be furnished prior to the execution of the Agreement.
- D. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.

- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

- B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

6. include completed operations coverage:

- a. Such insurance shall remain in effect for two years after final payment.
- b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Any insurance provided by Contractor shall be primary to any such insurance of Owner. The Owner will not be required to maintain insurance on behalf of the Contractor, or in addition to the Contractor, for any of the Contractor's actions associated with the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
 2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary

Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with insurers.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

5.11 *Amount of Insurance*

- A. Except as otherwise provided herein, the amount of insurance for each policy shall not be less than:

	Liability for Bodily Injury Including Accidental Death		Liability for Property Damage
	Per Person	Per Occurrence	Per Occurrence
Comprehensive General Liability	\$2,000,000	\$2,000,000	\$2,000,000
Contractual Liability required by Article 5	\$2,000,000	\$2,000,000	\$2,000,000

ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work. All of the foregoing responsibilities of Contractor shall be at the Contractor’s expense without addition to the contract price.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

- a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
 - 3) it has a proven record of performance and availability of responsive service.
- b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,

- b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
 - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and
 - 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection. Contractor shall not employ or permit any Subcontractor to employ any unfit person or any person not suitably trained and skilled in the performance of the tasks assigned in connection with any performance of the Work. The Owner reserves the right, but not the obligation, to require any person performing work hereunder to be removed from the site or project for cause.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance or deemed acceptance by Owner or Engineer or any such Subcontractor, Supplier, or other person or organization shall constitute a waiver of any right of Owner or Engineer under the Contract, including without limitation, the right to reject defective Work or release Contractor of any obligation under the Contract.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies

require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same. Any agreement with any Subcontractor shall be in writing and shall expressly provide for the assignment of such agreement to Owner and the collateral assignment by Owner to any entity providing financing for the Project or Work.

6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents. Contractor shall also defend all such indemnified parties in connection with any claims covered by such indemnity.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work. Additionally, Contractor shall have exclusive responsibility for the transport, storage and disposal of any hazardous or solid waste, as defined under Laws or Regulations, delivered or accepted at the worksite in connection with the Work, including the acquisition and compliance with any approvals, permits or licenses required in connection therewith. Contractor shall obtain, at its own expense, all approvals, permits or licenses as required for the ordinary conduct of its business as contemplated by the Work, including any permits required for hauling materials and disposing of waste to and from the Work site in connection with the Work.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs)

arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work. Contractor also shall pay all taxes, governmental fees, assessments, charges or levies assessed upon Contractor in connection with the Work. Upon the failure of Contractor promptly to pay any tax or fee under this section or under Modified General Conditions 6.10 or license fee or royalty under Modified General Conditions 6.07, Owner may pay such tax, fees or royalty and immediately recover the amount paid and expenses associated therewith from the Contractor or set off such amounts and expenses against any sums owed to Contractor by Owner.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

- a. Submit number of Samples specified in the Specifications.
- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

- a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

- b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
- 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
 - 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review:

- 1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
- 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
- 3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures:

- 1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
1. abuse or negligent operation or maintenance by persons other than Contractor, Subcontractors or Suppliers or any persons directly or indirectly (i) subject to the control of; (ii) acting pursuant to the directions of; or (iii) employed by Contractor, Subcontractors or Suppliers; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
 6. any inspection, test, or approval by others; or
 7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify, hold harmless and defend Owner, Engineer, Engineer's Consultants and the officers, directors, employees, agents, or other consultants of each and any of them from and against all claims, costs, losses, damages, demands, suits, causes of actions, proceedings, judgments, expenses and liabilities (including, without limitation, all fees and charges of engineers, architects, attorneys and other professionals and all court of arbitration or other dispute resolution costs) (collectively, a "Claim") caused by, arising out of or resulting from the performance of the Work (including any corrective action required with respect to any defective Work or Contractor's warranty obligations under the Contract Documents); provided that, any such claim is either (i) attributable to bodily injury, sickness, disease, or death due to injury to or destruction of tangible property, including the loss of use thereof and cause in whole or in part by any act or omission of Contractor or any Subcontractor or Supplier or any person or entity directly or indirectly controlled, employed or directed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable,

regardless of whether or not caused in part by any negligence or omission of any indemnified party hereunder or any third party or whether liability is imposed on any such indemnified party by Laws or Regulations or (ii) attributable to any demands or liens by any Subcontractors, Suppliers, or other person or entity performing any part of the Work arising out of any non payment of such parties for goods or services provided to Contractor.

- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
 - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 - 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.

- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of the Engineer, Owner shall appoint a new Engineer, whose status shall be that of the former Engineer effective as of such appointments under the Contract Documents.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents. The foregoing shall not be construed to limit the right of Owner or Engineer under the Contract Documents to require Contractor to correct defective Work; provided, however, no exercise or failure to exercise such rights shall relieve Contractor from any of its liability or obligations under the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Compliance with Safety Program*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. The foregoing shall not be construed to limit the right of Owner or Engineer under the Contract Documents to require Contractor to correct defective Work; provided, however, no exercise or failure to exercise such rights shall be construed as a waiver or will otherwise relieve Contractor from any of its liability or obligations under the Contract Documents.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If

Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner or Engineer may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).
- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
 1. deny the Claim in whole or in part;
 2. approve the Claim; or
 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all reasonable costs necessarily incurred and paid and properly documented by Contractor in the proper performance of the Work, all as determined by the Engineer, except those excluded in Paragraph 11.01.B. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
 5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the

costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the fault or negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:*
1. Contractor agrees that:
 - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance:*
1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 2. there is no corresponding adjustment with respect to any other item of Work; and
 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05. In order to be enforceable, the Change Order must be accepted in writing by the Owner and executed and/or acknowledged by the Engineer.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation,

inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them. Contractor shall not be allowed an increase in the Contract Price or extension of the Contract Time (or Milestones) to the extent attributable to any exercise by Owner of its rights under this paragraph.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. repair such defective land or areas; or
 - 2. correct such defective Work; or
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be 10% of the cost of Work completed to date as approved by Engineer, unless otherwise stipulated in the Agreement.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
- 4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
- 5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment:

- 1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or

- d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended

purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be

responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the

Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:
1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
 2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
 3. Contractor's repeated disregard of the authority of Engineer; or
 4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
 2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
 2. agrees with the other party to submit the Claim to another dispute resolution process; or
 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.